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4-H Boys and Girls Grow More Food

By Frederick Simpich

FROM her wheelbarrow she took some boards, a saw, hammer, and sack of nails.

"This is how a 15-year-old 4-H girl makes a pig trough," she said. And then, before a crowd of farmers at Maryland State Fair, in Timonium, she sawed and pounded and built that trough, and poured in water to prove it wouldn't leak.

"A pig is half water," she explained, "but his stomach is little; so he must drink often" (page 574).

Carrying live rats in a cage, a gas squirt gun, and a can of poison, two boys followed the pig-trough girl. They showed how to rid a barn of rats and mice (page 567).

Then a girl of 16 lectured on grass, silage, and haymaking. Pots set before her held clover, alfalfa, and lespedeza. She told how many acres of any grass it may take to graze a cow, or how much of certain feeds it takes to make a gallon of milk.

Talking on "Care of Sheep," a farm boy wrestled a kicking lamb and showed how to judge it for shape and wool texture. "And don't ever let your lamb get at green apples," he warned. "They give him stomach fuss, or make him shoot his cookies. And watch his feet in muddy times." With a pair of pruning shears he showed how to trim a sheep's hoofs.

Visiting Eastern States Exposition at Springfield, Massachusetts, I lunched at a party with a 4-H boy and girl as host and hostess. Girls had cooked the lunch from meats, fruits, vegetables, milk, eggs, and butter all furnished by Club workers.

Across America, as I write, thousands of other farm boys and girls are guests at county and State fairs, at livestock shows in Denver, Kansas City, Chicago, Texas. You see them carefully combing their calves, dusting off prize pigs, polishing the horns and hoofs of cattle, or braiding the manes and tails of giant Percheron and Clydesdale horses (pages 556, 571, 573).

Others show how to repair a tractor and "keep its nose clean" or to care for plows, potato diggers, and other farm machinery, while on long tables in countless exhibit halls girl students of home economics display their vegetables, canned fruits, cakes, and salads, or clothing they have made (pages 559, 563, 576).

4-H Clubs Have Trained 14,000,000

Since the Children's Crusade set out to free Jerusalem from infidels, our world has seen many youth movements. But nothing like this 4-H work. These Clubs number 1,759,911 active members and to date have trained some 14,000,000 American youngsters.

"Father and Mother met at a 4-H camp, when they were members; now my sister and I belong," said a Maryland boy. Over and over, I met these second-generation members.

By Act of Congress this youth training is placed under the United States Department of Agriculture, land grant colleges' extension services, and the 6,534 county agents in all the States. Across the land are 80,286 4-H Clubs and 203,211 volunteer country men and women who serve without pay as local Club leaders (page 576).

Aid comes, too, from a long list of corporations and individual donors. They give awards ranging from scholarships, breeding stock, and farm implements to gold medals, cash prizes, and free trips to fairs and national 4-H conventions.

"There is no movement of greater value to our country," says Mr. Fowler McCormick, Chairman of the Board of International Harvester Company.

John H. Jeter, The Dallas Morning News

This Texas Tom Sawyer, a Grand Slam Winner, Has Lost a Tooth but Not His Smile

Oliver Davis of Carrollton, an exhibitor at the Dallas County Fair, won first, second, and third prizes for the best squash, which he raised all by himself. This seven-year-old is counting the years (three) until he is eligible to join the 4-H. He can then be a Future Farmer of America, also, if he chooses.

As early as 1931 Harvester gave 100 scholarships to aid farm boys and girls. In 1947, to gain higher yields of food, feed, and fiber crops through wiser farm methods, better seed, and best use of farm machinery, it gave increased aid to boys from 44 States in field crop contests and to girls in 42 States in frozen food contests.

In the same way, such giants as General Motors, Servel, Inc., Westinghouse Educational Foundation, American Viscose Corporation, Kraft Foods Company, General Foods Corporation, General Mills, Inc.; the Burlington, Baltimore and Ohio, Union Pacific, and Illinois Central railroad systems; Firestone, Allis-Chalmers, Kerr Glass Manufacturing Corporation, John Morrell & Co., the Standard Oil Company in various States, and others give awards to aid this work.

Jack Jackson, The Des Moines Register & Tribune

Lord Inverchapel Appraises a Fat Ear of Iowa Corn

When Roger Newburn (right), of Eagle Grove, invited the British Ambassador to "come out and see how we grow corn," His Excellency went. "They treated me like one of the family," Inverchapel told the author. "I did my share of the chores; I came to like this fine, wholesome farm family so much that later it was my pleasure to entertain them at the Embassy in Washington." Lord Inverchapel recently retired to his ancestral farm in Scotland (page 568).

"No movement in modern education has so captured the imagination and heart of the American people," says Paul E. Miller, Director of Agricultural Extension at the University of Minnesota. "In our State more than 500,000 boys and girls between 10 and 21 have benefited by the 4-H 'Learn by Doing' program."

4-H's—Head, Heart, Hands, Health

When a boy or girl joins a Club, he makes this pledge:

I PLEDGE
My head to clearer thinking,
My heart to greater loyalty,
My hands to larger service,
My health to better living,
For my club, my community, and my country.

The name "4-H" comes, then, from Head, Heart, Hands, and Health, and the symbol is a four-leaf clover, with an "H" on each leaf.

When a member joins, he chooses one or more projects for his training job. Girls go in for baking, canning, sewing, or home furnishing. A boy—or girl—may raise a garden, a field crop, or start with a calf, pig, or lamb, or a flock of poultry. From such simple starts with one calf, scores of youngsters have built up and come to own prize purebred herds worth snug fortunes (pages 565, 575, 580, 581).

Still others go in for forestry, dairying, soil

Chicago Tribune

England Congratulates Oklahoma on the Glossy Look of a Grand Champion

Richard de Quincey of Bodenham, Hereford, England, who was a judge at Chicago's International Live Stock Exposition last year, shakes hands with Claude Millwee of Fort Cobb, Oklahoma. De Quincey named Big Boy, Millwee's 1,100-pound Shorthorn steer, the junior grand champion.

conservation, wildlife protection, and many other activities.

Leaders aid youths to stick to allotted tasks, think straight, speak in public, and enter prize-winning contests. For nearly 20 years Maine has led all other States in percentage of 4-H members who complete the year's projects.

At State fairs today 4-H work is a top farm exhibit. On the Minnesota State Fair Grounds, as in several other States, 4-H'ers have their own magnificent exhibit building.

"Win Without Bragging, Lose Without Squealing"

At some contests prize animals often sell for dizzy prices. An Iowa boy's 1,212½-pound grand champion steer sold at an American Royal Live Stock & Horse Show in Kansas City, Missouri, for $35.50 a pound—enough cash to buy a whole farm in Iowa, whose State 4-H motto is "to win without bragging—to lose without squealing."

Often such high prices are paid by a fancy stock farm, by a well-known restaurant just for publicity, or by the winner's friends to help him or her along.

"But we don't think that's wise," says Russell Thorp, of the Wyoming Stock Growers Association. "Such inflated prices give the farm boy a wrong idea of how much money he can make later in the cow business."

One Cornell instructor says the "stimulation credited to cash awards is much overrated. A greater stimulus, in our opinion, stems from the desire of the individual to excel in his achievements."

National Geographic Photographer Richard H. Stewart

A Whip Dangled Before the Eyes Freezes the Horse in a Proud Pose

Boy and girl teamed in this Maryland 4-H Club drew numbers to see whose horse should be exhibited at the State Fair, Timonium. At times a girl of not more than 12 years may lead in a 1,000-pound animal.

There's no attempt at Cornell to develop a purely rural society, its instructors point out. All farm-bred youth can't stay on the land. There isn't land enough nor are all country-born boys and girls interested in farming as a life work.

Yet this training enables American youth to explore and study farming as a profession and to apply scientific information to daily farm and home jobs. It also gives those who may not wish to plow and plant a wider basis for decision.

"Do you want to marry a farm boy?" I asked many farm girls. Some giggled, some looked thoughtful and said, "Why not?"

"While our 4-H program is not designed for matchmaking," says Extension Editor Earl C. Richardson, of Michigan State College, at East Lansing, "contact between boys and girls in Club work does make for matrimony. Their interests are the same. If the farm girl really loves the farm and wants to make a career of farm homemaking, she has a good chance to look over young farmers who show tendencies toward success."

Georgians "Dedicate the Plow"

In Druid Hills Baptist Church at Atlanta, Georgia, a "Dedication of the Plow" ceremony is held each year on "4-H Sunday."

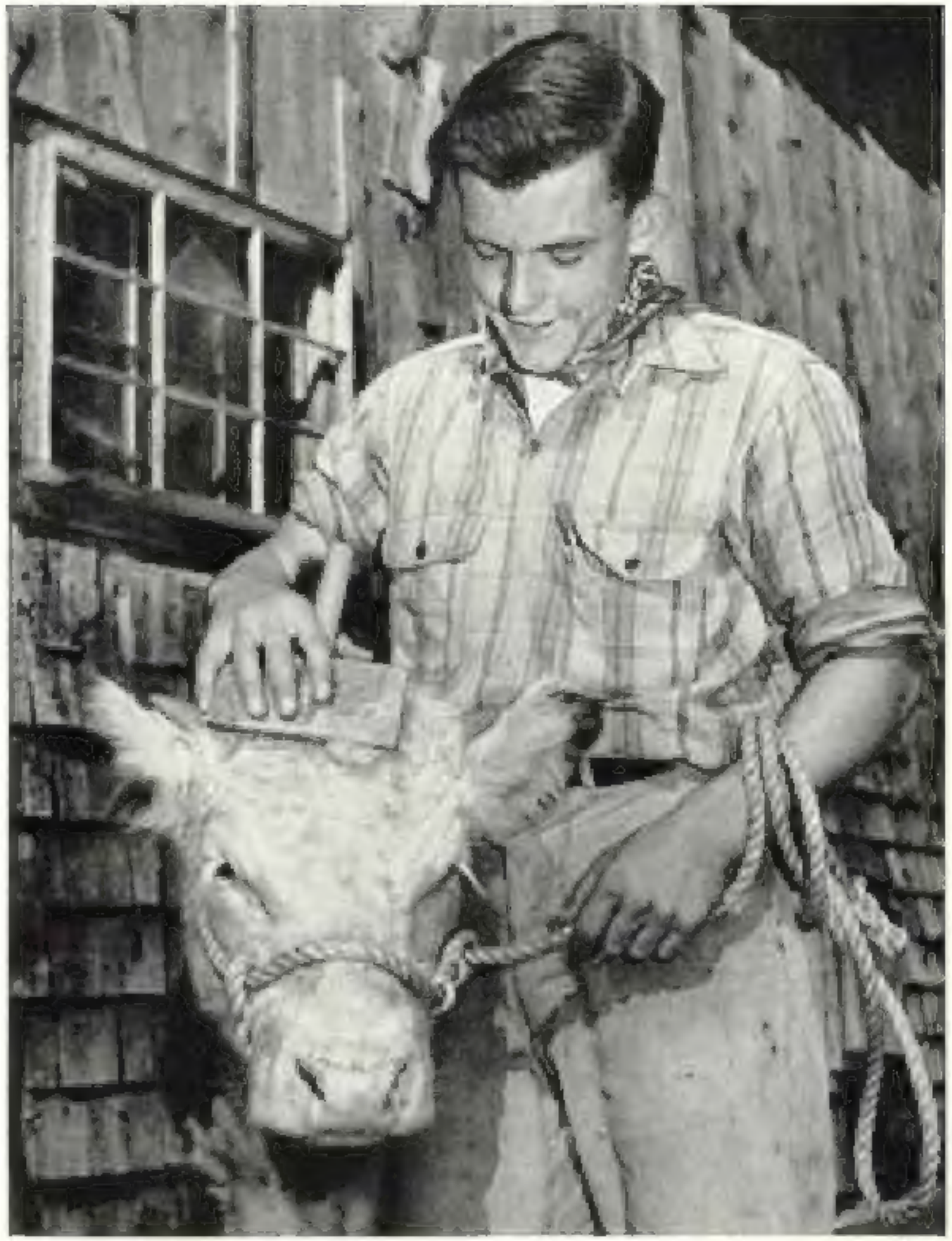
From 4-H work Georgia sees good results in better fences, homes, barns, and cropping systems; during World War II its youth raised over $21,000,000 worth of food and sold over $34,000,000 worth of bonds.

Since all farm youth can't stay on farms, Georgia seeks to train its boys and girls to make good citizens and to love their work, no

Chicago Tribune

Prize-winning Delegates to the National 4-H Club Congress Parade at the International Live Stock Exposition, Chicago

Led by a 4-H brass band (not shown), hundreds of boys and girls from all parts of the Nation line up before a huge audience. Posters carried by various groups boast of the number of animals grown and the increase in members' bank accounts. Top winners ride the horse-drawn wagon (page 573).



Does a Calf Enjoy a Dry Shampoo? The Smile Says "Yes"

With speed and strength, J. Gilman Allard of Bolsters Mills, Maine, captured this four-month-old Hereford in a "calf scramble" at Fryeburg Fair. First to grab and halter the calf, he became its owner (page 570).

National Geographic Photographer Robert F. Sisson

Althea Looks at the Girl Who Built Her Dressing Table

Miss Chapman, who lives in Portland, Maine, has spent six of her 16 years in 4-H work. "I love it," says she. "One objective is to make your own home a happier, more convenient place to live."

matter what occupations they finally choose. And they do!

The late Gen. George S. Patton, Jr., gave me a ride in one of his tanks, driven by a Georgia farm boy who nearly broke my neck as he rolled his tank down a steep bluff!

"Georgia farm boys make bully tank drivers," said Patton, "from so much previous wrestling with farm tractors."

From the Farm to Varied Fields

Before me lie some 75 letters from Schools of Agriculture, successful men and women and editors of farm papers, who once had 4-H training. Every one repeats the story of 4-H achievement in growing more meat, wheat, and potatoes, and cites stirring cases of former 4-H boys now leading busy lives at good work in cities.

Go into any packing plant, big cannery, or factory that processes food; talk to wrinkle-suited men who hurry across country in dusty Fords, buying for the wholesale poultry, provision, and fruit firms or the chain stores, and see how many are former 4-H boys. They learned how, on the farm, raising food.

Big food firms in Kansas City, Omaha, St. Louis, Chicago, Atlanta, all like to hire 4-H-trained farm boys.

Girls, too. The manager of a giant mail-order store in Springfield, Massachusetts, had 4-H training. So did a comparison shopper for a great Chicago store.

One country girl I met travels all over America as a stylist. She visits 4-H Club meetings where girls are showing the dresses they've made and tells them about new patterns made by the firm she represents.

"Where does style originate?" I asked her.

"Nobody knows," she said. "Paris says *here*. New York echoes; so does Hollywood and even Dallas, Texas.

"Anyway, I know several 4-H girls who've designed striking costumes. One shot a mole, skinned it and made a fur coat for her doll! One shot a deer and used the hide for her handbag.

"Some hope to land on Fifth Avenue as professionals like Hattie Carnegie or Madame Schiaparelli. Maybe they will! After all, Levi overalls and fancy cowboy shirts originated on our western dude ranches. Why not an Oklahoma Indian handbag, or a skirt with buckskin fringe from Cheyenne?"

The Illinois Central Railroad lately sent out a special train through Louisiana and Mississippi loaded with 4-H girls and boys and with their exhibits of livestock, poultry, sugar cane, shrimp, and sweet potatoes. Four-H home economics exhibits were there too. One of the directors of the railroad, Thomas E. Wilson, Chairman of the Board of Wilson & Co., Inc., went along part of the way with them.

That train, all painted up with 4-H symbols, stopped at 79 towns in the two States to acquaint people with what 4-H is doing. It was like a circus. Thousands of visitors swarmed through the cars.

Another railroad with a distinct 4-H policy is the Burlington, whose west-bound rails were laid through virgin territory *ahead* of agriculture.

When 4-H'ers came along, sons of pioneer settlers, Burlington helped them. It granted cash to counties in its territory which would hire county agents able to teach Club members; it set up experimental farms, ran educational trains, and helped introduce new crops.

Preserving the National Heritage

Soil erosion control is a steady job for farm boys. From Utah, Idaho, Kentucky, Wyoming, Indiana, and some 35 other States come reports of boys who have ditched, terraced, laid drainpipes, seeded old fields to grass, filled up gullies, and built ponds and dams. They have a jingle, author unknown, which runs:

> Hordes of gullies now remind us
> We should build our lands to stay
> And, departing, leave behind us
> Fields that have not washed away.
>
> When our boys assume the mortgage
> On the land that's had our toil,
> They'll not have to ask the question:
> "Here's the farm, but where's the soil?"

Close to 2,550,000 boys and girls, members of 4-H Clubs, have been trained in conservation work, ranging from halting erosion to feeding quail (page 578).

There's no joy in living on a farm where no flower beds bloom, no bird song is heard, no rabbits romp in the thickets, no squirrels scold from green treetops, and no wild ducks glide in at dusk to roost on your pond.

Wildlife doesn't harm good farming. In conservation camps boys and girls learn, for example, that some hawks, gulls, foxes, and even snakes do more good than harm.

Sure, birds eat your fruit and berries; but they also eat the insect pests. Some small birds each day eat insects and weed seeds equal to their own weight. Owls catch chickens; but also one pair of owls, under scientific study, ate 1,000 field mice in six months!

How to protect wildlife, then, is one of the main courses taught at these 4-H camps. Soil, water, trees, gardens, and field crops all

  Kodachrome by J. Baylor Roberts

A 4-H Beauty Presents a 4-H Feast for Hoosier Eyes at State Fair, Indianapolis

Some 1,760,000 American boys and girls in 80,000 4-H Clubs learn to be scientific farmers and good citizens. To help win the war, club members canned 74,000,000 quarts of food.

Georgia's Goddess of Light Points Her Wand at Farmer's Magic Lamp

Sleeping Beauty Pigs May Not Be Dreamy, but It Pays Off in Prizes

[illegible]

Mary's Little Lamb Grows Up To Be Jeanette's Chimpanzee Companion

[illegible]

Husking Bee and Fall Bonfire, Are Events of the Harvest Moon at University of Massachusetts, at Amherst

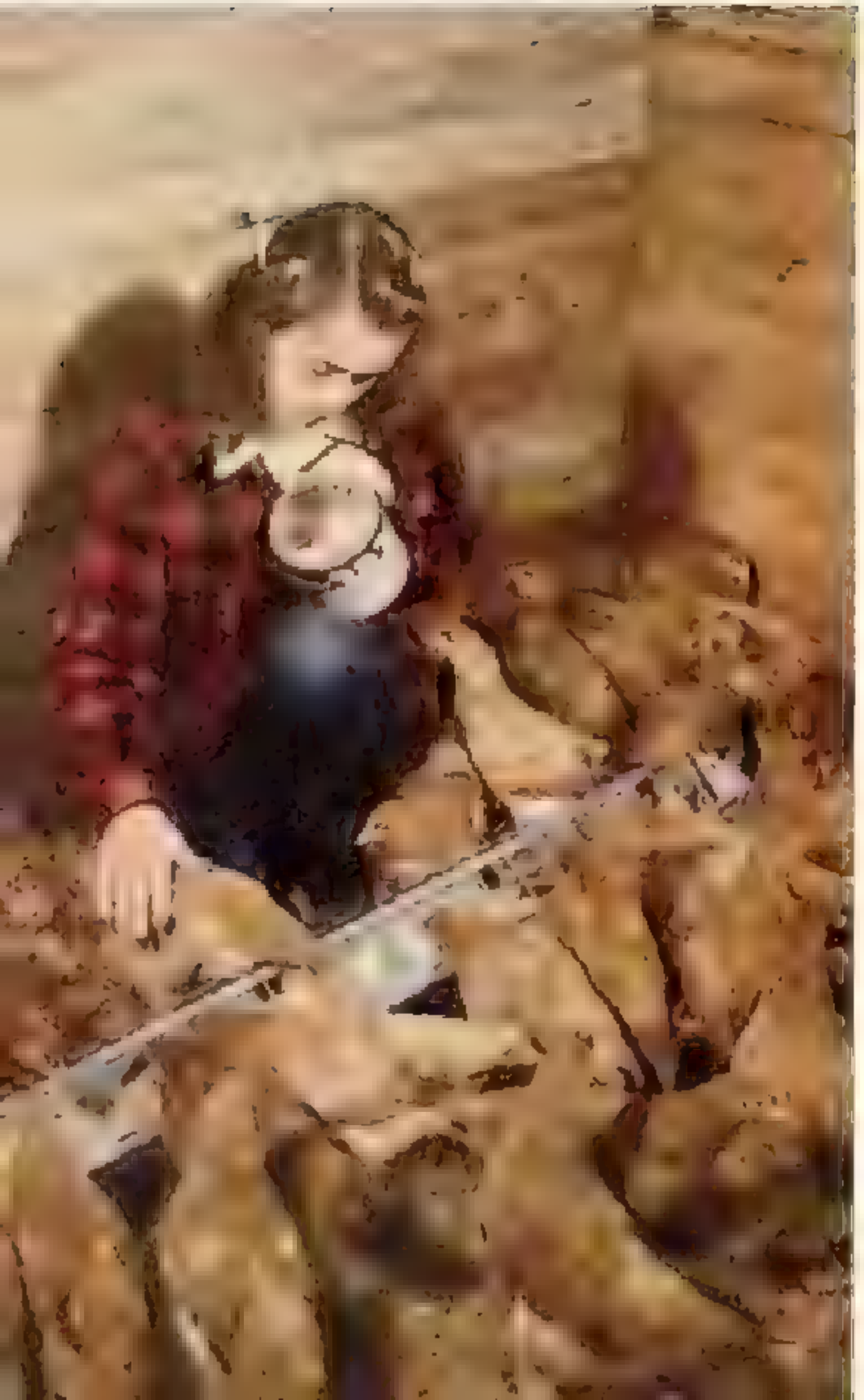
Miss 4-H Sews a Button; Maybe She'll Become a Stylist

[illegible]

Miss Vermont Says "I Can" and Puts Up 500 Jars a Year

[illegible]

Vietcong's Tanks and Arms Explode as Sylvan Lemmon Goes to the Highest Bidder at Cuchung, Mung



The Loving Care Spent on Pets Nets Substantial Cash Returns

★ Sierra Carries for Her Own Deep Freeze

[illegible]

★ Junior Bakers Bake Bear and Recipes

[illegible]

tie in. Clubs learn to dig fishponds and drainage ditches, plow fields in terraces, stop gullies with dams, rotate crops, use fertilizer, plant trees, and put out forest fires, or to leave bits of crops unharvested or a fence row uncleared or unburned as cover, food, and protection for small wild animals and upland game birds.

FBI Says 4-H Strengthens Democratic Society

Dean H. J. Reed of Purdue's School of Agriculture, at La Fayette, Indiana, says more than half the young men enrolled there in agriculture are former 4-H members.

Indiana, too, stresses the value of moral training. Writes Mr. Reed: "One of our juvenile court judges says in all his experience in [illegible] who has been in 4-H Club work."

On this point comes a letter from Director J. Edgar Hoover of the FBI:

"I am deeply grateful for the opportunity to make a contribution to your NATIONAL GEOGRAPHIC story on the work of 4-H Clubs. The spirit of hard work, honest living, and fair play instilled in youth through this training is a material factor in our national well-being, and strengthens immeasurably our democratic society."

The art of using words to convey truth and raise emotions is taught as part of this work. At Club meetings I heard quick-witted country boys and girls of 18 to 20 debate such tough themes as "Is it immoral to use atomic bombs in war?" and "What should we do about Greece?"

That cynical old saying that youth is too fine a thing to waste on young people is all upset when you see these 4-H'ers in action.

Achievements vary widely. Vincent J. [illegible] of York County, Nebraska, won a $4,000 scholarship in a model car competition offered by an automobile craftsmen's guild and is now at Notre Dame. An Idaho boy, working in forestry, won a scholarship at Harvard. Peggy Sample, of Rutherford, Tennessee, won a prize for suggesting a name for a pedigreed calf. She sent in that name without telling anybody; imagine her family's excitement when a check came to her for $100!

Mosaics Made from Nature

I watched one 17-year-old Maryland girl working at ceramics. From a lump of clay she shaped a frog and glazed it.

"Now I bake it three hours in this electric kiln, and there's your salable piece of ceramics," she said to an attentive class of some 90 girls. "This past winter, while in high school, I made and sold lapel pins, book ends, ash trays, and other pieces."

"Where do you get your patterns?"

"For this," she said, "I just caught a frog. If I want to make a plant design, I go out and pick a pretty leaf or maybe a flower."

Since all work and no play makes Jack dull, summer camps all over America bring fun and recreation to thousands of 4-H boys and girls. Some camp sites and buildings, usually in the State parks, are owned by the States and often by individual Clubs that have bought sites and built lodges or received them as gifts from private donors. We visited several.

Adult leaders and chaperons—and motherly cooks—run the camps. Daily doings range from dancing, rifle shooting, group games, bird hikes, forestry, and botanizing to group singing and lessons in archery and swimming.

I watched one young lady, new director of physical education in a southern college but herself a former 4-H member, teaching youngsters to swim. Few had been in a pool before.

"What's hardest about your job?" I asked.

"Conquering their fear," she said. "First I make 'em float. I say lie down, as if you were on the bed, flat on your back, and spread out your arms and legs. Put your head back and breathe—and stick your stomach out! Mamma's always telling you to pull your stomach in. I say stick it *out*—that's how to float!"

In three days she had that whole crowd of landlubbers swimming like ducks, unafraid.

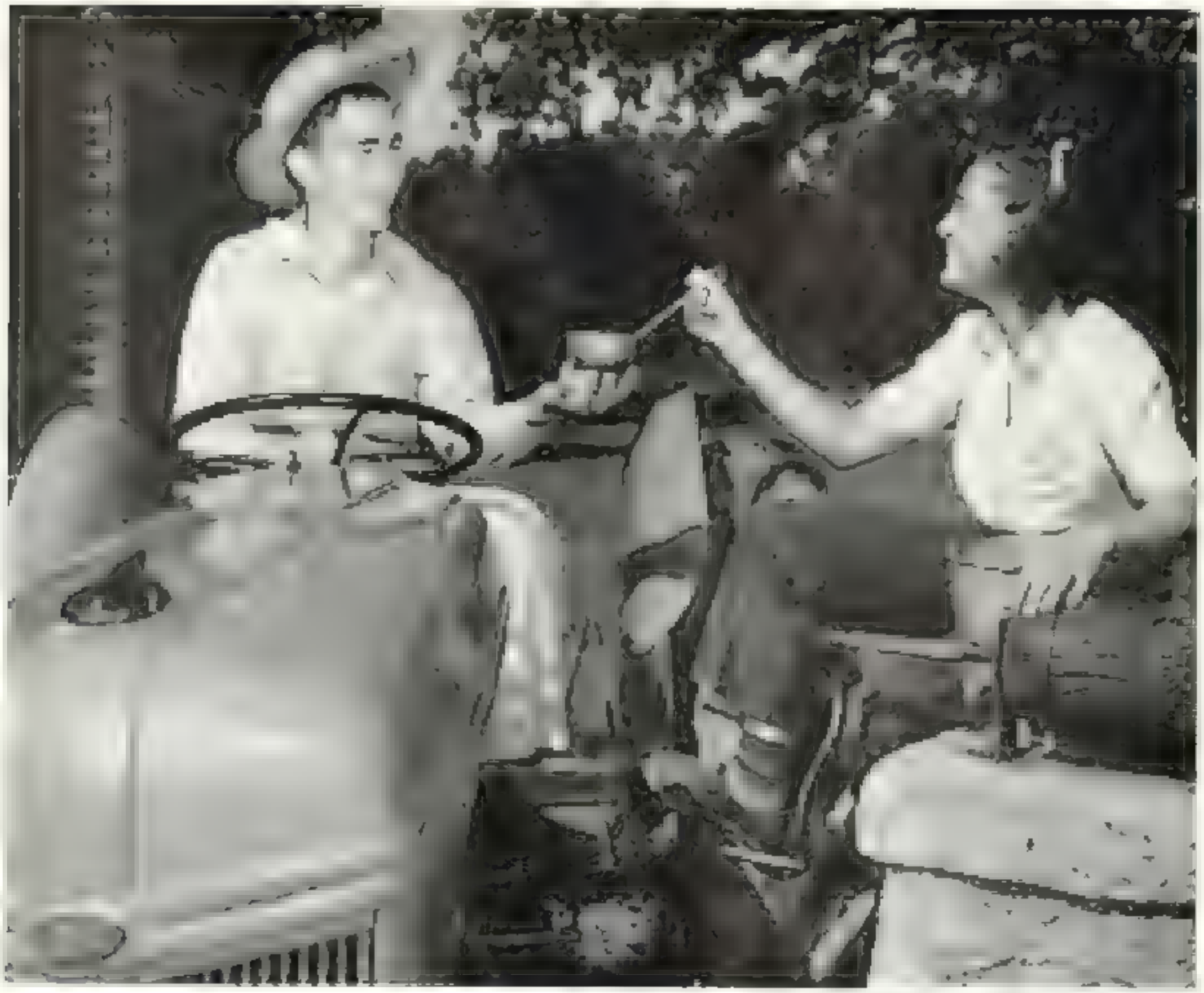
All across America this great, growing youth army mixes work with play. It agrees that healthy boys and girls are a finer farm crop than pigs and calves. Hence, as it sows and reaps it also sings, dances, and debates—and finds "sermons in stones" and "books in the running brooks."

In the Tradition of Daniel Boone

How many city girls could catch and dress a chicken? How many city boys could trap a mink or skin a skunk?

Born close to the woods and wildlife, most country boys are just naturally part Daniel Boone at heart. On farms from Michigan to Texas, on autumn or winter evenings after the milking is done and livestock is all fed, many a farm boy goes out to set his traps; pelts bring good cash prices.

These two boys at the Maryland State Fair who showed how to trap and destroy rats were in dead earnest. Last year rats ate more than 200,000,000 bushels of our grain. That's a big share of all the shiploads of grain we're sending to starving Europe this year.



Brother and Sister Drink from the Old-fashioned Well on Their Georgia Farm

Clarence E. Benton of Ringgold won the shine together when he was adjudged the State's outstanding 4-H [illegible]

[illegible] important [illegible] Four Oklahoma [illegible] were [illegible] airplane [illegible] to Kansas City for the best [illegible] in their county.

[illegible] British Ambassador [illegible] Washington, [illegible] and [illegible] who [illegible] with [illegible] on his tour [illegible] 4-H Club [illegible]. He [illegible] [illegible] from [illegible] Newburn.

British Ambassador Visits an Iowa 4-H Boy

When a 4-H group was visiting at the British Embassy in Washington one of the [illegible] Newburns of [illegible] Iowa, [illegible] a [illegible] with the Ambassador [illegible] to [illegible] visit.

"[illegible] I [illegible] door in Iowa," [illegible] Newburn.

[illegible] Ambassador. "I'll come out there and see [illegible]."

"Maybe that's just a polite [illegible] answer," said young Newburn. "Why [illegible] [illegible]?"

[illegible] Newburn [illegible] [illegible] country people.

Later I asked the Newburn [illegible] to visit me at the Embassy here in Washington [illegible] [illegible] very good days together.

In How Many Barns Has This Fossilized Comedy Been Found?

[illegible]

"Hey, Grab a Calf! Get a Halter on Him and He's Yours for Keeps!"

[illegible] must stand clear. If the calf [illegible]

A Famous Beautician Braces His Cow's Tail

[illegible]

Stop Bleating, Lamb! Many Would Envy You That Caress!

[illegible]

Uncle Sam's Army Plants the 4-H Clover Leaf Symbol in Korea

[illegible]

[illegible] Young British farmers. I [illegible] some of the Future Farmers of America. First the Americans found my boys "good guys," then "well guys," and finally they promoted them to the top rank of "regular guys."

[illegible] we [illegible] the FFA in our Young Farmers' Clubs. I [illegible] arrange for a large number of young Americans to come over here and visit our farm homes in England, Wales, Scotland, and the north of Ireland during the harvest season.

[illegible] and Christian training of 4-H and FFA [illegible] of civilization. Just answers to the [illegible] youth movements of Hitler and Mussolini.

Ceres Placed Ahead of Mars

I lived two years in Germany, just before Hitler, and saw his youth movement in the making. Boys used wooden guns, not hoes, and the [illegible] was how to kill people—not how to help them. [illegible] the Sieges Allee (Avenue of Victory) was packed then with the giant marble figures of warriors.

[illegible] Hitler's [illegible] manifesto; but they see [illegible] beauty in a fat steer [illegible] a golden crest over a waving field of green corn or a sea of rice wheat than in a flock of statues. They put Ceres above Mars

Engraves on Steers' Ramps Indicate Catalogue Numbers at a Union Stock Yards Sale

[illegible]

A [illegible] last December 1,100 of these [illegible] to Nebraska 4-H Club Congress [illegible] State Club leaders and [illegible] to agents. They entered [illegible] of the [illegible] International Live Stock Exposition. [illegible] of [illegible] and a program of group [illegible] in the [illegible] to the [illegible] Motors Kraft, Spoo[illegible] Company, International Harvester and others.

[illegible] were awarded the [illegible] prizes and other recognitions for the [illegible] of 4-H [illegible].

[illegible] Nebraska [illegible] 4-H [illegible] boys and girls [illegible] hum and speeches [illegible] Nov. After one [illegible] parade, I saw a [illegible] of the Nebraska [illegible] in [illegible] and [illegible] dress. [illegible] Lincoln on a total [illegible] in prizes [illegible] prizes.

[illegible] Lincoln [illegible] Mexico [illegible] and Iowa [illegible] and [illegible] 4-H work [illegible].

[illegible] Scotland [illegible] 4-H [illegible] in Scotland.

[illegible] 4-H [illegible]

Want to Build an Automatic Hog Waterer? Ask These Maryland Girls

[illegible]

[illegible] and begin [illegible] learned here [illegible]

[illegible] Hawaii. [illegible] the beach at [illegible] and wade knee-deep in plantation [illegible]

4-H at the White House

Each year in June hand-picked groups of 4-Hers visit Washington to see Uncle Sam's [illegible] workshops in full blast. They camp [illegible] Arlington Farms, on the Virginia side [illegible] Potomac, or stop at Washington [illegible]

[illegible] how our government works, or ought to work, and learning how to vote [illegible] [illegible] Congress, the National Bureau of Standards, Smithsonian Institution, Naval Gun Factory, the Supreme Court, [illegible] the NATIONAL GEOGRAPHIC MAGAZINE offices—even the Zoo.

[illegible] the White House grounds with the President's [illegible] Research Center at [illegible] where some of the most scientific [illegible] farms in our country are [illegible]

There they get science [illegible] and potatoes [illegible] and other [illegible] help [illegible]

This Classic Pile of T-bones, Short Ribs, and Hamburger Is the Pride of an Indiana Boy

This Day Club Proves Not All 1st Girls Are Extroverts

[illegible]

Four Pounds of Rabbit Will Soon Be Hasenpfeffer

Is She Popular with the Bigger Hoosier Appetites?

▲ In Sense the National Sergeant Major, Young Marksmanship Stands Surveying [illegible]

▼ Here Stirred His New Thoughts Prompted Automatic Weapons Complete [illegible]

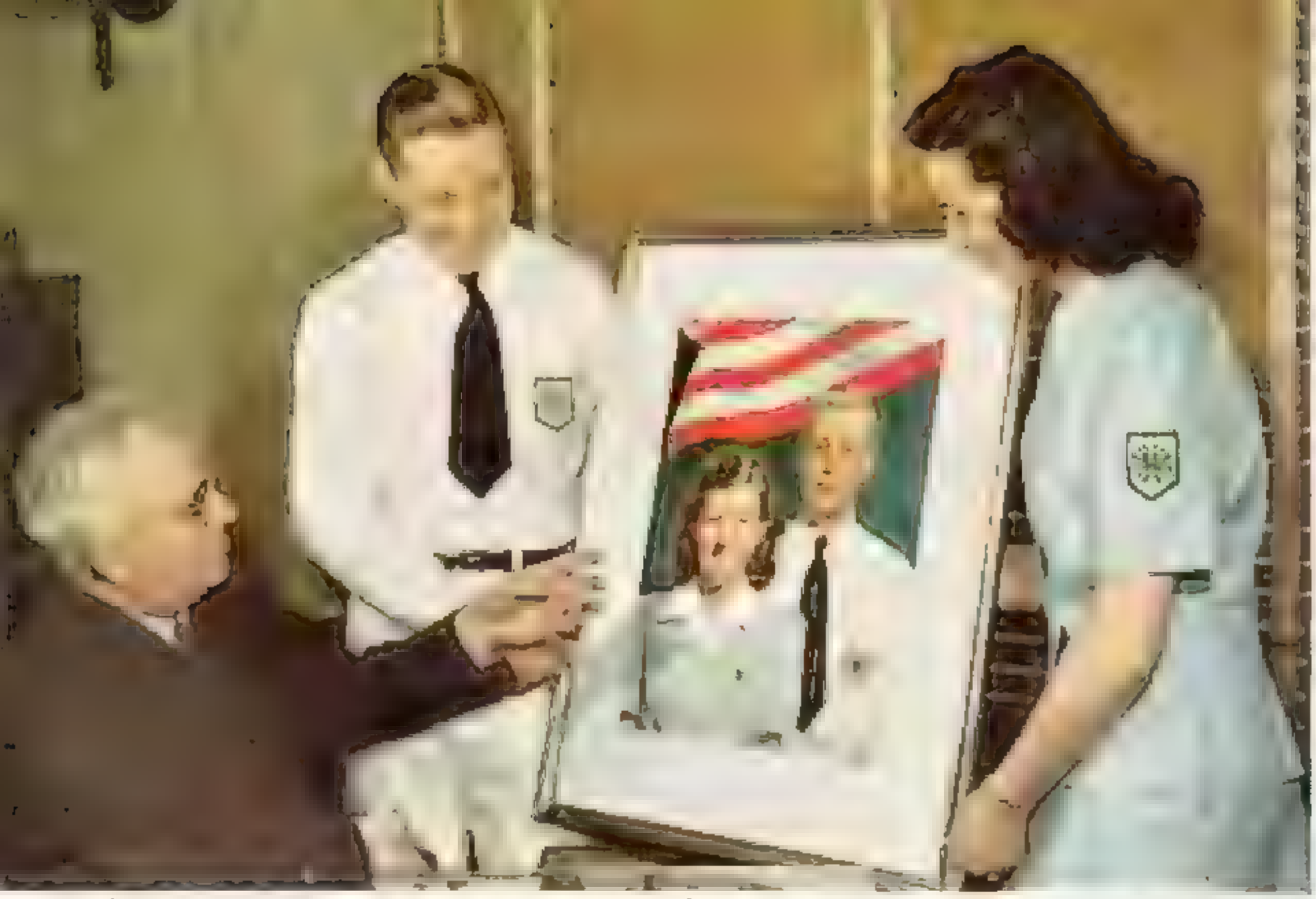
"Nacional" Queen of the Tulip Festival Chooses Her Champion For a Royal Tribute

▲ To Impress the Judges, a 4-H Showman Stows His Jersey Heifer by Hand

▼ Colorado Snow Sleuths, Drying Out, Turn Their Toboggans to the Sun

▲ Project Gossip Is More Fun than Work
These Oregon Brothers Bond

▼ Tucker Propelled in Suspends, Ensures a
Dog's Life for the Show Ring



★ The 1989 4-H National Calendar Picture Has Been Painted, and Here It Is

[illegible]

★ Florida Boys Sandycoat an Orange Tangy a Smart but Deadly Foe

[illegible]

Portugal Is Different

By Clement E. Conger

OUR powerful Constellation, inbound from America, sailed serenely over the white Tower of Belem, standing on the bank of the River Tagus. Far below us tiny sailing vessels, with strangely upturned bows and lateen sails, tacked across the stream (page 602). They brought to mind the great discoverers who set forth from this same harbor.

Graceful as an eagle, our plane set down at Lisbon's new Portela de Sacavem Airport. My taxi driver raced across the several miles from the airport to central Lisbon (page 603).

Swiftly leaving the country behind, we flashed by the bull ring and in a moment were squirming through narrow, winding streets full of cars and horse carts. Pedestrians, many carrying loads on their heads, walked in streets as much as on sidewalks.

Other taxis missed each other by the proverbial coat of paint. Streetcars rang warning bells, but cabbies paid no heed.

We dashed up hills, rounded curves, and careened across intersections with horn wide open.

Arriving safe but breathless at my hotel, I knew how Sir Malcolm Campbell, the daredevil racing driver, felt when reporters asked his first impression of Lisbon (Lisboa). Reflecting on his taxi ride from airport to hotel, he is quoted, "I've never been so scared in all my life!"

Lisbon's hotels, like those in all major cities, are likely to be crowded, but they are pleasant and inexpensive.

Lisbon, a Medley of Colors and Noises

Portugal's capital is as colorful as it is [illegible] shade—pink, blue, green, or yellow. Brilliant flowers garnish walls and lawns.

In their way, most of the city's 800,000 people are equally colorful. Women carry all manner of things on their heads—boxes, baskets, furniture, mattresses, even desks, but mostly fish.

Lisbon calls its statuesque fishwives varinas. They take their name from Ovar, the coastal town from which they came. Varinas form a tight society of their own. In their veins flows Phoenician blood. By the thousands they peddle fish from door to door on flat, head-borne trays (pages 584, 608 and 609).

Frequently you will find a pair of tired-looking shoes resting on a fish tray. Barefoot varinas carry shoes, as Englishmen carry umbrellas, for emergency use. If a policeman reprimands one for breaking the ordinance against bare feet, she makes swift amends. Her shoes lie within easy reach; quickly she slips them on if needed. Once the law is out of sight, she replaces shoes on fish, and comfortable bare toes grip mosaic sidewalks once more.

Shrill and persistent are the fishwives' sales cries, and not unmixed with vituperation. Other peddlers are just as noisy.

Here and there roosters and hens add their cackle to the din. In World War II, Lisbonese began raising chickens with a vengeance.

War changed the face of neutral Portugal not little. Neither Axis nor Allies cared to overrun the country, whose 8,000,000 inhabitants and Maine-size area offered few serious obstacles (map, page 587).

Lisbon became the warring world's crossroads for the exchange of mail and information. Spies moved in by the score. Portuguese financial houses supplied native currencies to equip Allied secret agents dropped into enemy held countries.†

Meanwhile the Government, having a British alliance dating from 1373, made the Azores available as anti-U-boat bases.‡

Exit Spies, Enter Tourists

Today the aura of international intrigue is gone, the Portuguese are their smiling, friendly, uninhibited selves. They are the delight of travelers who appreciate old customs, character quirks, and costume dress.

Phoenicians came trading to Lisbon more than 2,000 years ago. Nowhere did they plant their heritage more enduringly. Sailboats of Phoenician design still ply the Tagus (Tejo) [illegible] the Phoenicians.

Opening up from the river front is the spacious Praça do Commercio, known for two centuries as "Black Horse Square" because of an equestrian statue of King José I.

* See, in the National Geographic Magazine, "Lisbon, the City of the Friendly Bay," by Clifford Albion Tinker, November, 1922, and "Castles and Progress in Portugal," by W. Robert Moore, February, 1939.

† See, "Lisbon, Gateway to Warring Europe," by Hugh Kilmartin, National Geographic Magazine, August, 1941.

‡ See, in the National Geographic Magazine, "American Airmen in the Azores," 10 pls. in color, February, 1946, "European Outpost: the Azores," by Harriet Chalmers Adams, January, 1943; and "New Map of the Atlantic Ocean," by Lou A. Boral and Wilbur Chamberlin, September, 1941.

Saleswomen with Fishy Wares Aloft Parade Through a Lisbon Market

[illegible]

Kitchens on the square and streets of the lower town were [illegible] to Prime Minister Pombal, who [illegible] the task after the earthquake of 1755. [illegible] water and fire swept [illegible] more than [illegible] people and a large part of the capital. King Jose asked his Prime Minister what was to be done.

"Sir," replied Pombal, "bury the dead and take care of the living."

Several years up from the Tagus River is Pombal's model Roman Rossio. Long ago it was renamed Rodrigo-Monteiro Square. In [illegible] decade [illegible] restoration [illegible] Architectural [illegible] restoration [illegible] to the point of [illegible]. Though the statue [illegible] has been removed as a traffic hazard, enough of the original remains to [illegible] the [illegible] of Lisbon's [illegible].

[illegible] owner of Rodrigo-Monteiro [illegible] an elevator designed to [illegible] the square city, saving [illegible] hundreds of backbreaking steps [illegible] A [illegible] fare is less than [illegible] Avenues [illegible] of the Lisbon [illegible].

Thousands Drink Coffee on the Avenida

Beyond the [illegible] stands the third of Lisbon's central squares, Praça dos Restauradores. Here begins the magnificent promenade, Avenida da Liberdade, [illegible] popularly known as the Avenida. Two side streets, one parkway, and a center [illegible] the Avenida. [illegible] wide.

Here on a summer evening I saw thousands gathered on [illegible] sidewalk cafes or [illegible] processions. Lined [illegible] tables [illegible] the [illegible].

At the top of the Avenida [illegible] Parque Eduardo VII. Trees [illegible] many [illegible] under [illegible]. [illegible] lakes, fountains, and [illegible] rocks. A [illegible] of western slope [illegible] an inch apart, maintains a cool temperature

A Sidesaddle Equestrienne with Perfect Aplomb Rides Past a Don Quixote Windmill

[illegible]

[illegible] In [illegible] the [illegible] in earlier wars.

I climbed [illegible] to the Sé Patriarcal, or Cathedral, [illegible] in Romanesque style by the first King of Portugal. [illegible] towers stretch [illegible] the [illegible] was chosen as an appropriate [illegible] which [illegible] a bishop [illegible] with the Saracens.

Stay-at-home Wives Shun Night Life

Lisbon friends [illegible] of their night life.

For an establishment [illegible] to Western food [illegible] lit streets of [illegible] Occidental.

[illegible]. Here [illegible]. A friend [illegible]

During [illegible] the [illegible] of Portuguese folk song [illegible]. The songs tell [illegible] love, jealousy, heartbreak, and [illegible].

"The first one or two [illegible] by the house," my friend explained. "After that, individual [illegible] make their selections with the guitarist and stand up and sing."

[illegible]

Meanwhile [illegible] their way to the [illegible]. The crowd is composed [illegible] entirely of men. Portuguese wives seldom see the [illegible] the few who do are [illegible].

My friend [illegible] woman from the American Embassy and said: "Nothing [illegible] the presence of [illegible] women here, [illegible]—it [illegible] different [illegible]."

[illegible] the American [illegible]

Lisbon Solves Its Ups and Downs with an Elevator Which Seems To Be Going Nowhere

a club full of mirrors and neon in the Manhattan tradition. One mural shows the New York skyline. Other decorations satirize ancient Greek and Portuguese life. The orchestra specializes in Latin music, but at least a third of its selections are American foxtrots played in the jazz manner of 1947, and the dancers achieve an odd bouncing effect.

Relics of Portugal's Golden Age

Leaving central Lisbon, I journeyed down the Tagus to near-by Belem (Bethlehem). Belem preserves three reminders of Portugal's glorious past. They are the Tower of Belem, the Monastery of Jeronimos, and the National Coach Museum. Senhor Trindade, a tourist official, was my guide.

In the midday heat we walked to the Tower. All brilliant white, the fortress-palace stood like a sentinel beside the Tagus (page 630).

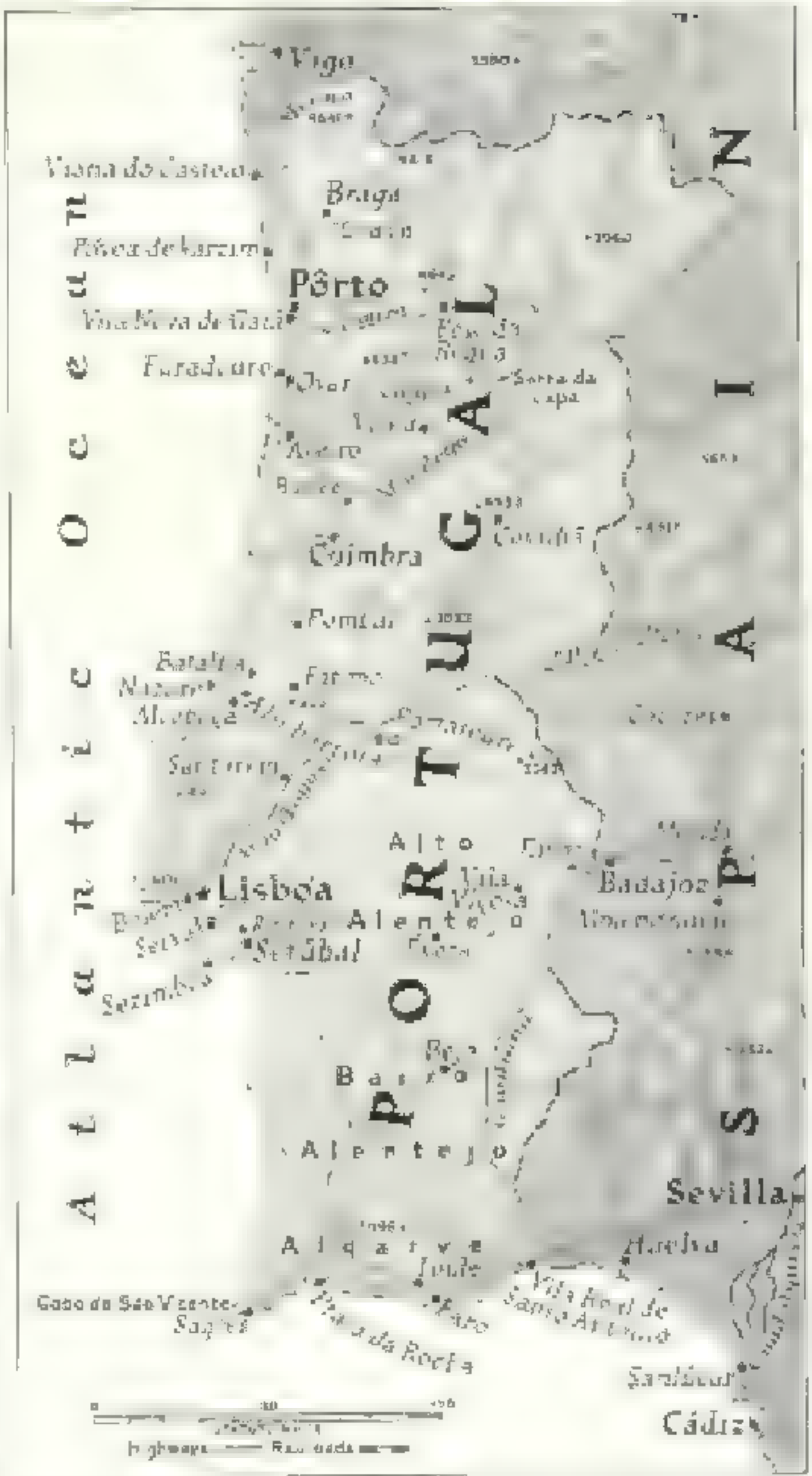
Climbing to a battlemented parapet, Senhor Trindade and I inspected the gargoyles. Strangest was the figure of a monkey playing a violin.

If ever any one structure signified an entire country, it is this Tower—the heart of Portugal. In 1497 Vasco da Gama set sail from the site on his epochal voyage around Africa to India. Diaz knew this spot when he began the first voyage around the Cape of Good Hope in 1487. So did Cabral, who took possession of Brazil in 1500. Affonso de Albuquerque passed by on his way to India.*

Not so large as Virginia, Portugal in the 16th century ruled more than half the known world, thanks to her intrepid voyagers.

Stone Elephants Bear Kings' Tombs

The huge Monastery of Jeronimos occupies the site of the Seamen's Home founded by Prince Henry the Navigator (page 604). King Manuel I vowed to erect a convent there if Da Gama's voyage to India succeeded. He laid the foundation stone a few weeks after the discoverer's return.



Portugal, the Size of Maine, Explored Half the Globe in the Great Age of Discovery

I looked up at the monastery's door and marveled at its magnificence. The ornate style, Manueline, is named for the King whose rule climaxed Portugal's golden age.

"Come inside," said Senhor Trindade, "and I shall show you one of your heroes." Entering, he pointed to a marble tomb. I read the

* See "Pathfinder of the East: Vasco da Gama," by J. R. Hildebrand, NATIONAL GEOGRAPHIC MAGAZINE, November, 1947.

stone lettering. I was standing at the resting place of Vasco da Gama. He had the vision to sail into the unknown and find the sea route to India. Light through stained glass played a spectrum over his vault.

I went exploring. In the transepts, black stone elephants, tusked with Indian ivory, bore the tombs of ancient kings.

In the National Coach Museum we found dozens of gilded coaches bearing witness to royalty's bygone brilliance. Two plain coaches surprised me: I was told they were for the illegitimate children of a king. Three coaches were used by an 18th-century ambassador to the Vatican.

He required more than 500 horses and mules for his year-and-a-half trip across the Pyrenees and Alps.

Coal Scarce, Wine Abundant

Next I took passage north on a glittering all-steel American streamliner, incongruously drawn by an ordinary black wood-burning engine. Portugal, like many other countries, was short of coal.

My destination was Pôrto, the Douro River harbor specializing in port wine (page 597).

As early as 1300, London merchants started importing port as relief for winter's colds. In 1703 Britain and Portugal signed the Methuen Treaty regulating trade.

In consequence, a big industry and an important city—port and Pôrto—grew side by side on the Douro.

Likewise, the national name originated here. For Pôrto grew from the harbor at the mouth of the Douro called *Portus Cale*, from which the word Portugal came.

A visitor to downtown Pôrto might think he was in an American city were it not for the two-wheeled oxcarts. Wooden yokes, almost two feet high, clamp the heads to oxen together. Carved and painted, the yokes bear designs of ancient origins.

Fishes are common motifs, presumably early Christian. Stars call to mind old astrological cults. Crosses are supposed to inhibit witches from taking free rides. Bristling tufts of horsehair line the yokes' upper edges.

To learn about port, I called at the Institute of Port Wine, supervisor of the industry. Its director explained how it functioned as a Government agency to safeguard the trademark "port," and to guarantee the wine as produce of the Douro district.

To see the vineyards, I went by train to Pêso da Régua, a Douro-side town in the wine country.

On the river I saw two curious sailboats, called *rabelos*, heading upstream with billowing sails and empty casks (page 596). I could see steersmen operating the boats with sweeps set in high stern platforms.

These boats' sole purpose is to haul wine to Pôrto. At first glance they appear to be clumsy antiques. Actually, they work in efficient rhythm with the seasons.

When spring thaws swell the Douro, the wine-weighted boats coast downstream. Empty, they return in summer. Then the prevailing wind, switching directions, drives them against the current. Lack of cargo helps them cross shallows exposed by summer's drought.

In Pêso da Régua I called at the Casa do Douro, control office of the region's wineries. Eduardo Mendes de Serpa Pimentel, its assistant director, said:

"My friend, there are no secrets in the making of port. A hot, mountainous terrain favors the grapes. Vines grow on the terraced stairsteps of canyons dug by the Douro and its tributaries."

Rich Soil Is Built by Hand

Mountainsides are composed of mica schist, a rock which forms a flaky soil rich in grape-stimulating chemicals.

Senhor Pimentel and I, touring vineyards built during the last 400 years, drove past hillsides terraced to the skies. Retaining walls were of granite dragged into place by hand. Blocks of schist for soil were moved in the same backbreaking manner. Spring rains often washed walls and soil away; then work had to start all over.

We watched young wall builders lay granite blocks just as their fathers had done for countless generations.

For helpers they used their small brothers some no more than 10 years old, I judged. These pitiful youngsters, climbing precipitous slopes, bore rocks on their backs. Their tired old-man faces seemed expressionless.

"*Vossa Excelência*" (Your Excellency) or "*Boa tarde*" (Good afternoon), they greeted us. Then they dumped their loads and trudged away for more.

Senhor Pimentel pointed out a gorge where in 1792 a tremendous rock was blasted out of the river. Removal of this navigational barrier extended the port district to the Spanish border and doubled its area.

Treaders Crush Grapes to Music

My guide explained that every grape was [illegible] imported root resists insects of the genus *Phylloxera*, a grape louse which began to ravage Portuguese vineyards in 1863. In their second

Whirling Skirts Balloon Like Doughnuts as Póvoa Folk Perform a Ballet on the Sand

[illegible]

[illegible] American [illegible] a graft of native [illegible]?

Senhor Pinheiro continued: "The vintage comes in September and October, when the grapes have ripened. They are carried to [illegible], big stone tubs. Nothing is added to help fermentation. Then treading occurs.

"[illegible] men, barelegged and [illegible], [illegible] back and forth, crushing the grapes.

"When they tread to the rhythm of an [illegible] music, [illegible] are required to take every sanitary precaution. [illegible] [illegible] part.

"Centuries-old, the [illegible] method makes the grapes [illegible], and keeps the [illegible] movement. Machinery cannot equal [illegible] [illegible] could not be [illegible] in no other way."

[illegible] is [illegible]. [illegible] the [illegible] it is [illegible]. [illegible] the [illegible] is [illegible]. Brandy [illegible] to [illegible] fermentation and preserve natural sugar.

[illegible] [illegible] [illegible] and [illegible].

Returning to Porto, I [illegible] the tasting of port wine. [illegible], I crossed the Douro to the [illegible] of Vila Nova de Gaia. There British and Portuguese merchants store wines in lodges (warehouses) for export.

Managers of Casa [illegible], one of the largest Portuguese firms, took pride in showing me about their centuries-old lodges. As far as eyes could pierce the gloom [illegible] [illegible] casks stretched [illegible] rows of bottles lay on their [illegible]. I saw men tasting, [illegible] [illegible].

[illegible] the [illegible] [illegible] the public [illegible] [illegible] what [illegible] the world's [illegible] [illegible]. These are [illegible] of what [illegible] [illegible] a [illegible]. They reminded me of [illegible] [illegible].

Foster's Music Hails Portuguese Leaders

My next journey took me to Braga, [illegible] north of Porto.

There Portugal was celebrating the [illegible] [illegible] of [illegible] which [illegible] [illegible] and established the present stable government.

Co-leader of that revolution was Marshal António Óscar Fragoso Carmona. Already 80 years old (born November 24, 1869), he was still Portugal's President (page [illegible]).

To settle his country's shaky finances, Carmona called Dr. Antonio de Oliveira Salazar, a university professor, to head the Finance Ministry. Later Salazar became Portugal's Prime Minister and kid-gloved strong man.

In Braga I saw a demonstration of the affection in which Portugal holds its leaders. Near the crumbling city gate Carmona and Salazar changed cars. A crowd surged in to cheer them and shake hands. Though any assassin might have taken advantage of the moment, the leaders seemed imperturbed. As far as I could see, they had no guards.

At that moment the National Republican Guard band struck up a tune. I could not believe my ears. I hummed the rhythm. Yes, it was true. Stephen Foster's "Way Down Upon the Swanee River" was the selection. Everyone cheered.

A Portuguese newsreel man winked at me and said, "They're playing it just for you."

I found out later that the people love Foster's music. Sousa's is second in popularity; his father was of Portuguese descent.

After a military parade I inspected the early 12th-century Cathedral, whose mellow stone seemed almost ready to disintegrate. "As old as the Cathedral at Braga," say the Portuguese, to express antiquity.

Ruined Citânia—Who Lived There?

Not far from Braga I climbed a hill to view Citânia, a ruined Iberian city of ancient times. Like Pompeii, Citânia has been unearthed. Four concentric walls still encircle its stone houses.

Rarely did a house have more than one room, a few were circular. Roofs must have been thatched. Original gutters in narrow streets still carry off rainwater. Another drainage system runs beneath the houses.

Archeologists have found traces of Roman civilization, notably Roman milepostsbut they have failed to solve Citânia's riddle. The story of his Iberian people vanished with them.

On roadsides near by I discovered contemporary houses not very different from the ancient ruins. These are homes of the very poor. They have no chimneys, smoke eddies through roof tiles, so that they appear to be on fire. In smoky one-room interiors all family activities take place, just as they must have in the deserted city on the hill.

Roadsides and Stations Beautified

With Jim Cameron, a Scottish friend, I next toured the magnificent valley of the Vouga. A small, clear river, the Vouga flows from the snow-covered 3,000-foot Serra da Lapa.

In the valley we saw farmers threshing grain as in Bible times. Their horses and oxen, dragging heavy weights, circled threshing floors. In small towns sheep and goats casually roamed main streets.

Here and there we found waters harnessed for electricity. Portugal makes even dams things of beauty.

Portugal's Motor Club devotes 10 percent of its funds to eye-pleasing projects. Flowers enliven highways; geraniums border one road for more than 50 miles. Billboards are rare.

Railroad stations are attractive. Most are covered with blue tiles depicting historical scenes (page 594). Their grounds are patterned flower gardens. On some lines station masters submit their gardens in yearly competitions.

How Portugal Goes to College

I journeyed alone toward Coimbra, the ancient university city in central Portugal. Prime Minister Salazar once taught there.

Looking across the River Mondego, I saw the city in all its glory. Crowning a hilltop it shone like an illustration from a fairy tale. Indeed, I found a fairyland in closeup when I photographed a children's Lilliputian park (page 622).

I wandered through narrow, winding streets. Some were tortuous stairways; a few had unusual names. My favorite was the Street of Confused Palaces. As in olden times, charcoal still hung by the door of a workshop, and a brush denoted a wineshop.

Here and there one may pick out university students by their class ribbons. A yellow one stands for medicine, red for law, blue for letters, white and light blue for science.

In Coimbra's annual May festivity, graduates' ribbons go up in flames. Preliminary parades, fireworks, dances, and bullfights delight visitors. Then comes the climax: the ribbons burn in an intimate household utensil.

Typically collegiate students go about hatless, in long frock coats and flowing black robes.

As in most countries, the freshman has a difficult time. Seniors may mobilize him to declare his love to a fair passer-by or deliver a speech on "The influence of codfish on telephone wires." If the freshman refuses, he may be tried, and the punishment can be painful, sometimes in a difficult position. At night advanced students roam the town with scissors, wooden spoons, and clubs. Scissors give the out-of-bounds freshman an irregular haircut; spoons pound his fingernails; clubs are rarely necessary.

Turning southwest, I found the little town of Nazaré (Nazareth) nestling under a cliff

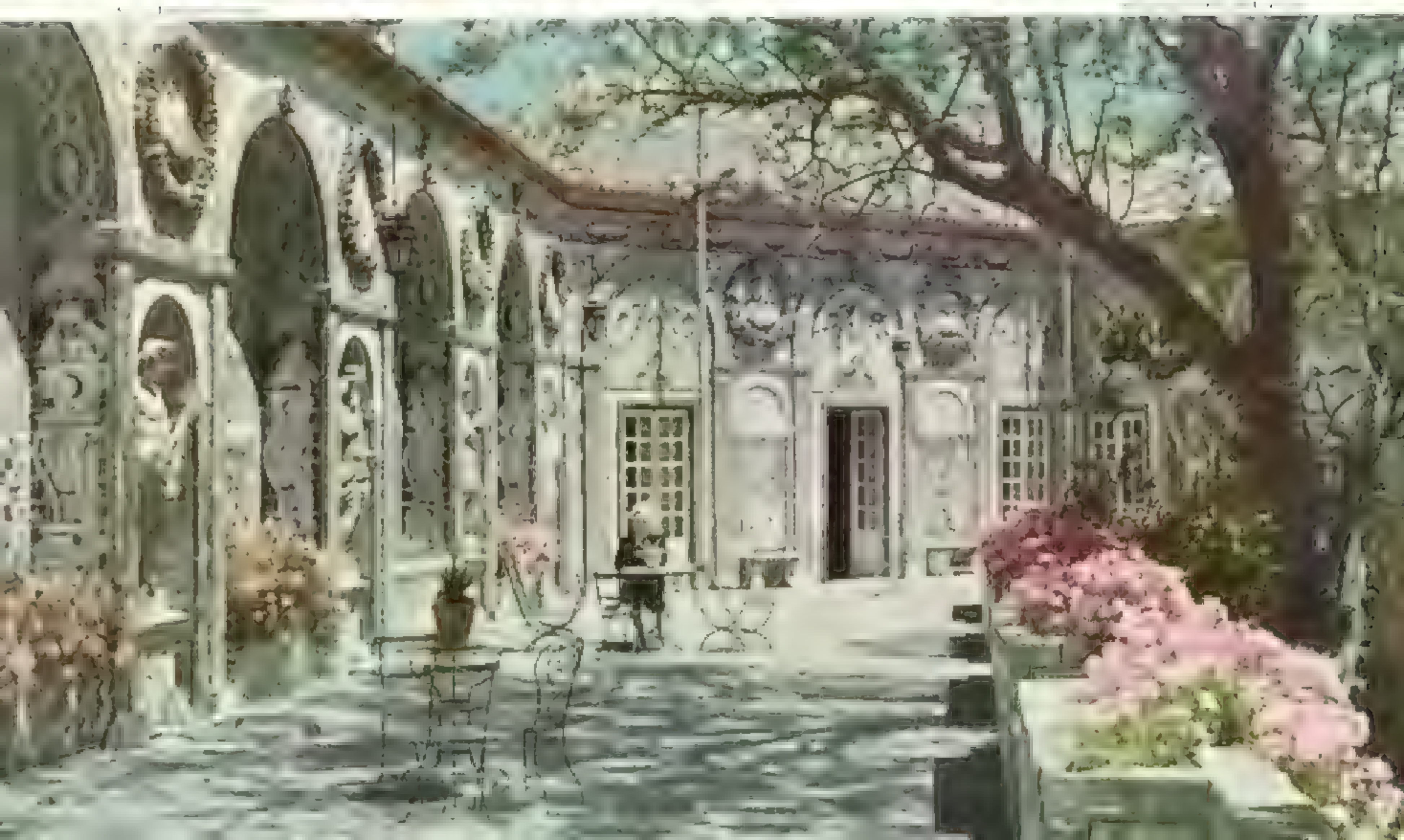
Mexico: Abbey's 500 Years Commemorate Portugal's Birth as a Nation

In Brussels, the Royal Palace. Two descendants of Leopold I, King of the Belgians: President Coolidge (Right) and Prime Minister Seipel (Left)

Beadle's Tunnel, Hits Mulberry and Closing Gate

Figures in Porcelain
(Boston's Street in
Ancient Vice)

Palace of the Cesarini, a Gallery of Old Masters, in the Lisbon Home of the Countess of Sarangosa



Water Carriers on the Dragon House Bellvang Sicily. Laundresses on the Westbound Slave Market There with Flapping Sheets

A Bridge of Two Levels Spans Paris, the Terraced City. Buildings on the Drawing Board Seem to Stand on One Another's Roofs

▲ Portland's Abundant Flowers Are Always in Demand in Pioneer Market

▼ A Country Road Plays Against Acres and Sounds Tedious to Consider for 50 Minutes

fronting the Atlantic (pages 610 and 619).

Nazaré's men folk are fishermen. I was amused to find them dressed in tartans not unlike Scotland's. However, the checks of contrasting colors are larger, some a foot wide. Shirts and trousers seem never to match (pages 612 and 614).

Nearly every man wears a *carapuça*, or long stocking cap (page 613).

Outstanding sartorially, Nazaré's fisherwomen are required to wear long black shawls. They seldom go to work without their load-battered black felt hats.

900 Monks Chanted Day and Night

A short distance inland I stopped at Alcobaça, a town noted for its magnificent abbey church (page 591). Once this was one of the richest Cistercian abbeys in the world and the grandest in Portugal. In the 12th century Affonso Henriques, first Portuguese king, founded the monastery to signal his victory over the Moors, whereby Portugal became a nation.

An English-speaking padre told me:

"In ancient days services were said here day and night by 900 monks in relays—never pausing, always chanting.

"Come," he bade me, "and see the gigantic kitchen. It has a stream flowing through it."

And so it did. Several feet wide, the stream gave cooks a never-ending supply of water.

Then the padre guided me to the chapel containing the tombs of King Pedro I and Inês de Castro, Portugal's Romeo and Juliet. At Pedro's order their recumbent effigies were placed foot to foot, so that on resurrection his eyes should open on his beloved Queen. Theirs is a famous story, subject of numerous folk songs.

"Inês de Castro, a cousin of the King of Castile," the padre related, "was a lady in waiting of Constanza, bride of Prince Pedro. The Prince was charmed by Ines's beauty. She bore him several children, and when Constanza died they were privately married.

Queen Crowned after Death

"Portuguese nobles, fearing Inês's influence, persuaded King Affonso IV, Pedro's father, to agree to her removal. In 1355 she was executed at Coimbra. After Affonso's death in 1357, Pedro had her judges tortured and slain. The new king then legalized his marriage legal. He ordered the dead Inês exhumed, crowned, and enthroned as Queen. Pedro's courtiers were compelled to kiss her cold hand. His nobles bore her body to Alcobaça. And here she rests, crowned after death."

Not far from Alcobaça stands the tiny village of Fátima, named for a Moorish princess. Now each year it is the scene of a Christian pilgrimage. I went to see the largest pilgrimage of all, that of 1946.

On May 13, 1917, three Fátima children tending sheep were convinced they saw a vision of a heavenly figure enveloped in a light more brilliant than the sun's. Speaking to them from above an oak tree, she invited them, they swore, to the same spot on the 13th of the five succeeding months.

That October thousands of Portuguese gathered in hope of witnessing her final appearance.

Witnesses told of seeing a white cloud envelop the children and of strange and fearful gyrations of the sun. A chapel was erected on the spot.

In succeeding years Fátima has drawn a host of pilgrims each May 13. Before 1946 the Vatican had recognized the disputed miracle.

For this pilgrimage the Portuguese engaged virtually every car in the nation weeks in advance. Lt. Donald Scott, Assistant Naval Attaché at Lisbon, and his wife agreed to drive me up to Fátima.

In the mountains the way became crowded. For miles thousands of pilgrims filled the roads. Some had walked 250 miles on bare feet. Others rode donkeys.

Cold rain fell on the 500,000 spectators at the first day's ceremonies. That evening the pilgrims camped in fields. Fátima had no accommodations for visitors except the sick.

At 11 p. m. the Scotts and I attended an open-air candlelight ceremony. Some 500,000 candles flickered in the pitch-black night and 500,000 voices chanted, "Ave, ave, ave."

Rain Falls; Up Go 700,000 Umbrellas

[illegible] morning rain fell in torrents. Nevertheless, Fátima had 200,000 additional pilgrims. Each time the heavens opened, 700,000 black umbrellas went up.

That day the Virgin of Fátima was crowned with gold from wedding rings contributed by Portuguese women. A papal delegate set the gleaming cap on her statue. As he did so, the multitude waved 700,000 white handkerchiefs—an unforgettable sight.

On a Sunday I went up the Tagus to the Santarem livestock fair and bullfight. Here, as in other Portuguese rings, bulls and horses are not killed and bulls' horns are padded.

Participants worked in 18th-century costumes. Spectators impartially cheered fighters and bulls. At times they booed the men for taking undue advantage.

Tower of Belem Marks the Spot from Which Vasco da Gama Sailed for India in 1497

[illegible]

[illegible]

Armen Strip a Cork Forest

[illegible] I went to the cork forests in the province of [illegible] [illegible]

[illegible]

[illegible]

Manuel Antunes Alves da Silva of the National Cork Board told me that Portugal's cork oaks covered more than [illegible] and annually produced more than [illegible] tons. He showed me Portugal's largest cork oak, said to be more than [illegible] years old. Three men's outstretched arms could not encircle its gnarled trunk.

In the cork forest the stripping had begun. Armen climbed trees and cut bark. Disturbed [illegible]

[illegible]

[illegible]

Cork Bounces on Air Cushions

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

Like a Galleon of Old, *Sagres* Glides Majestically Past Cape Cod under Full Sail

A Half-moon Fishing Boat with Picture Prow Rides the Surf on Straining Oars. Cable and Hook Await It on Furadoura Beach

[illegible]

Lisbon's Bicentennial Aqueduct Strides Across the Valley of the Mofarejo on 200-foot Stilts

[illegible]

Lacework in Limestone Is the Cloister of the Monastery of Jeronimos (Jerome) in Belem

[illegible]

Like a Captured Jungle Monster, a Sardine Trap Goes Ashore on Ten Stout Poles

[illegible]

[illegible] percent of their volume.

Cork's [illegible] millions of tiny cells of [illegible] filled with [illegible]. The tree that covered in half a [illegible] for [illegible] residence.

In general [illegible] percent of a stripping may be [illegible] bottle corks, and cork [illegible] ground [illegible] like linoleum and used [illegible] products.

Évora's Bones "Await Yours"

Évora was my next stop. Near it [illegible] I encountered [illegible] big enough to hide [illegible] and his 40 thieves. [illegible] feet high and 32 feet around, they were [illegible] like ancient Greek and Roman [illegible].

About 715 [illegible] Évora prospered as the headquarters of [illegible]. Later it [illegible] the Moors. Their architectural style still [illegible] and chimneys.

[illegible] are as large as [illegible]. To an American they look more like towers, pagodas, or extra attic rooms. Some are shaped like minarets; others resemble tents. To let smoke escape, their sides are slotted, like [illegible], with fanciful squares, rectangles, triangles, or circles. By creating drafts, the chimneys serve to air-condition houses [illegible].

While in Évora I [illegible] the [illegible] Florense, once headquarters of the Inquisition. Near by is a Roman temple from the first or second century. In a narrow street stands the house in which Vasco da Gama was married and his children were born.

Évora's mayor guided me through the Church of São Francisco, whose Chapel of Bones is walled with thousands of skulls. A [illegible] proclaims, "We bones here wait for yours."

King's Bloody Shirt Hangs in Closet

A [illegible] in the palace of [illegible] King of Portugal, at Vila Viçosa. His [illegible] hung in a wardrobe. [illegible] the palace was [illegible]. Some rooms were decorated with paintings by the King himself.

Next I headed for the Algarve, Portugal's southernmost province. Foreigners seldom visit the Algarve, and guidebooks virtually ignore it; yet the province has its charm. There the Moorish influence lingers strongest. Moors stamped the province with their language, customs, music, handicrafts, and architecture.

Algarve's very name is from the Arabic: *El Gharb*, Kingdom of the West. The Moors, who overran the province in the eighth century, remained until the 13th, when Crusaders helped the Portuguese to expel them.

The Moorish irrigation system is still used on some small farms. Water is drawn from an Arabian-style well by a *noria*, an intricate set of wheels and revolving buckets. A blindfolded ox or donkey plodding in a circle provides the power.

As the Algarve lacks rain in summer, all vegetation but trees turns brown. Spring brings a magnificent display of almond blossoms. Then the people delight in retelling the tale of the Norwegian princess wed to a Moorish prince.

On her first winter in the south, according to the story, the bride pined for the sight of snow. As spring arrived, the prince promised her that when she awoke again she should look out on a beautiful white landscape. Next morning she rushed to her window. The almond trees had burst into bloom! Prince and princess lived happily ever after.

Whistling Pots Ride Windmill Wheels

I arrived too late to see the almond blossoms, but I could not escape the huge windmills, each bearing sails as white as a ship's canvas. They crown almost every hilltop.

I never was able to see how Don Quixote fought a windmill until I examined one in the Algarve. Thirty foot wheels with revolving sails almost scraping the ground—an easy target for the Don's lance (page 585).

I found the wheel rims fitted with small clay pots, all facing the same direction. They seemed to have no logical purpose. A miller, however, told me he had placed pots on his wheel because of their odd whistling effect. He could be off in his fields and, if the whistling ceased, he knew the wheel no longer faced the wind and he must reset it.

Here in the hot south both sexes wear the masculine black felt hat. It supports a faded neckcloth to prevent sunstroke. As an added precaution, the people carry big black parasols. Watch them as they ride their burros and horses; wherever possible they stay in the shade. A canopy shields the typical two-wheeled cart; another canvas blankets the horse. Harness is gay with red tassels, tinkling bells, and fly-chasing mirrors.

I toured the south coast briefly.

In Praia da Rocha I was held spellbound by a sight of the town jail. Apparently there were no guards. In their stead, friends of the inmates loitered outside windows. Iron bars were fully six inches apart. Anything could have been handed through for a jailbreak, but who wanted to make the effort?

Prince Henry's Golden Dreams

At Sagres I inspected Fortaleza, where Prince Henry established his school for navigators. Picture of impregnability, the fort sits on a cliff. From this vicinity some of the great caravels of discovery sailed into uncharted seas.

Prince Henry, who dreamed of Portugal's greatness, was never the master nor even the partner in any voyage of discovery. He gained his title, the Navigator, because he encouraged so many ocean expeditions. Dying in 1460, he was buried in Batalha, Portugal's Battle Abbey (page 595).

In Fortaleza's courtyard I saw the white stones which Prince Henry set out to illustrate compass points.

I stood on a parapet and gazed at rocky Cape St. Vincent (Cabo de São Vicente), Europe's southwestern tip.

Here the seekers of *Ultima Thule* said goodbye to the continent.

As the sun sank into the sea, darkness mists swirled around the cape. My voyage of discovery to the land of the discoverers came to its end.*

* See "Adventural Journey Through Portugal," by Harold Culbertson Arnold, National Geographic Magazine, November 1927.

Notice of change of address for your National Geographic Magazine *should be received [illegible] Be sure to include your postal-zone number.*

Sand Carrier, Feeding a Cement Mixer, Jaipur, Rajasthan [illegible] Nazar Bazar

Lisson's Steamship Endeavours Moor the Pagas Pepe Docks by the Thousands Every Daily Cargo Precipitates a Powers Rise

Lisbon Law Says These Women Must Not Go Bareheaded

Hickory Stick Weaves a Dainty Sweater in Lunch Hour

Sculpted Figures Proclaim the Phoenician Ancestry of the Living Dead Sculpted Beneath Nazaré's 300 foot Cliff

Shouts and Oaths Assault the Atmosphere in Auction Market, Visitors Run a Fishmongers' Stress Gauntlet

In Nazareth Clowns Baggy Trousers Are Serious Garb Indeed. Fisherman's Trousers Stretch over Chucks, Some a Foot Square

◂Mother Packs Baby on Nazca Beach and Sheds Corn

[illegible]

A Fisherman Wears ▸ Cassmus Bulging Santa Elena Cap

[illegible]

A Fisherman Tooling Up for Commercial Fishing on His Wooden-hulled Boat

Nature's Thrills, Lures, and Scenery Dot the Lake Monday Morning Mists

Cook Oak, Stripped of Its Bark (Stock), Illinois Park District, Monroe County

A "Staggering" Load of Raw Cotton Is So Light It Does Not Bend Down Even When Piled Up on the Wagon

Gorges in the Andes and the Grand Canyon of the Santa Ana North of Pueblo

◄ Bessie's Office On Home of Kings New Ladies Aux with the Press

[illegible]

▼ Suzanne's Beach Tents Stocked Lake Lanyers, Bathers Fish or Surf

[illegible]

A Dragstone Loader Into Two Trucks, Discharges Firewood in a Waters Street for Awaiting

Bankers Trust Moves Works Are Restored with Dignity in London Slums

The Dawes Remembered Dr. Barnardo's Transport Postcards: Children in Canada

The Purple Land of Uruguay

By Luis Marden

With Illustrations from Photographs by the Author

Some [illegible] years ago W. H. Hudson rode the rolling plains of Uruguay and later described them in his unforgettable novel *The Purple Land*.

The Uruguay he saw was a trackless and fenceless land of cattle ranches. Vast estancias receded into the purple land of distance. Today, this smallest republic of South America has become the most densely populated. Yet the traveler can still ride five miles in the interior without seeing a house or a human being.

Smaller ranches predominate now, though there are plenty of big ones left. Agriculture grows increasingly important, but 80 percent of the land is still given over to the cattle industry.

A professor of geography at the University of Uruguay told me:

"Don't forget, our smallness is in great part relative. You could put Belgium, the Netherlands, Denmark, and Switzerland inside Uruguay and still have plenty of room left over. We look small on the map because maps of this hemisphere use a smaller scale than those of Europe, and also because of our tremendous neighbors."

Two Great River Systems

South of the Amazon Basin the green continent of South America swings inward from the Atlantic and spills its water mainly into two great river systems: the Paraná-Paraguay and the Uruguay.

Winding southward for more than a thousand miles, the brown and blue waters drain half a continent and rush together at last to emerge, wide and red, as the Río de la Plata—river, bay, or estuary—the geographers are still arguing about it (map, page 625).

On the left bank of the Plata lies the heart-shaped Republic of Uruguay, neatly spanning five degrees of latitude on the map. From its position the country was long called the Banda Oriental—the Eastern Shore of the Río de la Plata. Even today Uruguayans like to be called Orientales.

The little country on the Plata has been a leader in broadening educational opportunity. All schooling is free, and a Uruguayan citizen may progress from primary grades to a university degree without spending a cent, even for books.

Uruguay enacted the first 8-hour day in South America during World War I. Old-age pensions were established later. The State also issues insurance and operates the railroads.

In addition to private broadcasting stations, a Government transmitter in Montevideo plays popular and serious music almost continuously, without commercials. Thus the listener may choose between Beethoven and an ode to hair tonic.

One night I sat on the terrace of a Montevideo club with my geographer friend, Prof. Juan Lagomarsino. Across the indentation of the city's harbor we could see the low outline of the hill that gives the capital its name.

Only 450 feet high, El Cerro, the Hill, looks much higher in this flat region and must have been a prominent landmark when, in 1520, according to the story, one of Magellan's sailors first cried, "I see a hill!" (*Monte vidi eu*). (Page 654.)

Paris, not New York, was the model for Montevideo. From the roof terrace we looked down on the spacious avenues and palm-shaded squares of the capital (page 631). Sidewalk cafes line the main thoroughfare, Eighteenth of July Avenue, and many statues and public monuments increase the resemblance to the French capital.

Though tall office and apartment buildings rise above the downtown area, most buildings in this city of 800,000 are low, and we could see over them to the broad muddy background of the Río de la Plata. The "unlovely red billows" of the Plata have the quick, restless chop of enclosed waters, rather than the slow swell of the open sea.

What Is the Río de la Plata?

As we sat over coffee I asked, "Well, Professor, what is it? Bay, estuary, or river?" I had always called the Plata an estuary.

The Professor's face lighted up. "Ah, that is the question. It fulfills some of the conditions of each. According to international law, it is a river; rivers of course belong to the countries on their banks.

"If it is a river, then it is the world's widest—137 miles."

Sketching rapidly in my notebook, the Professor continued: "At first glance, you might think it an estuary; but it does not fulfill all the requirements of an estuary to the exact geographer.

When Sun or Rain Beats on Montevideo, Pedestrians Use the Sidewalk Arcades

[illegible]

North Dakota-sized Uruguay Is Squeezed Between Giant Argentina and Brazil

With her neighbor to the left, Uruguay shares the Río de la Plata, on which they have built their capitals, Buenos Aires and Montevideo, 125 miles apart. Only recent maps show the huge lake formed by the new dam and hydroelectric project on the Río Negro (pages 624 and 640).

"The discoverer, Juan Díaz de Solís, in 1516, called it the Mar Dulce—Freshwater Sea; not a bad description.

"So much silt has been carried out of the heart of the continent by the two great rivers that there is a coating of fine ooze 30 feet deep on the bottom of the Plata.

"Ships with a water intake on the bottom cannot enter because of this, and often vessels run aground, slowly and insensibly coming to a stop, until the next tide floats them off.

Winds Affect Plata More than Tides

Tides are not strong in the Plata, usually making a difference of little more than three feet. Winds influence the level much more; strong winds, particularly the *pampero*, blowing from the southwest, may raise or lower the level double that amount.

Winds affect the Plata's salinity too. Sometimes it is nearly fresh; then the wind shifts, and it becomes nearly as salty as the sea.

I have seen the Argentine coast at Buenos Aires, 125 miles upstream from Montevideo, one bare mud flat as far as the eye could reach. The wind had blown the Plata completely out of sight!

The sun sank as we rose to leave, and from the dark bulk of the Hill a lighthouse blinked against a salmon-colored sky.

[illegible]

Modern Is the Word for This Soda Bar-Apartment House

[illegible]

Years ago cattle in Uruguay were bred for hides and horns. Today hides are still important, but cattle produce for export mostly beef [illegible] canned, and in extract.

[illegible] would be horrified to know that [illegible]

Three large steam packing plants [illegible] for market. One nationalized sells meat domestically as well as abroad; the others pack [illegible] for export. When the American housewife buys a can of corned beef she may often find upon looking at the label that it comes from Uruguay (page [illegible]).

But to savor the national [illegible] at its best, the eater should eat it in one of the [illegible] or grills, that [illegible] Montevideo.

Toward the back [illegible] ever glowing charcoal. [illegible]

[illegible]

[illegible]

At an [illegible] restaurant [illegible]

[illegible]

When the [illegible]

To Toughen a Drum, Bend a Fire and Hear the Drumstead

[illegible]

being served, one of my hosts prepared to mix the salad.

"I'll tell you my formula for good salad," [illegible] "You must use soft olive oil like [illegible] brilliant vinegar like a maiden and then mix like a woman."

First- and second-generation Spaniards and Italians form a large [illegible] of Montevideo's and Uruguay's population. Almost every quarter of the [illegible] is Italian-style [illegible] pizzerias and grills which serve [illegible] the [illegible] Italian [illegible]. A generous wedge costs three cents.

Italian [illegible] occur commonly in the Republic, particularly around Salto in the northwest. In fact, [illegible] Rio de la Plata area that the Spanish of the region has acquired an Italian cadence and lilt.

But whether Spanish, Italian, or *criolla* (persons of Spanish descent born in America), the numerous [illegible] of the capital [illegible] a friendly convivial [illegible] to the city.

Musicians [illegible] tables on the sidewalk and [illegible] *espresso*, strolling [illegible] discuss politics, horses and [illegible].

[illegible] play in the larger cafés. These [illegible] violin, bass viol, and two or three *bandoneons*, the concertina that is the typical [illegible] of the tango.

More [illegible] than an accordion, a bellows [illegible] with rows of small buttons and no piano keyboard. It has a mellower, rounder tone, less strident than that of the accordion.

Tipicos play chiefly [illegible], waltzes, and *milongas*, a faster, jumpier version of the tango.

Uruguay's Tango

[illegible] was born in Buenos Aires [illegible] tango, "La Cumparsita" [illegible] Uruguay. The late Gerardo Matos Rodríguez [illegible] the classic when he [illegible]

Santa Teresa Fortress, a Five-pointed Hedgehog of Eighteenth-century Pentagon

[illegible] started the fortress in 1762. Spaniards captured it the same year and completed the [illegible] of Vauban, the French fortification genius of the time of Louis XIV. Once used [illegible] for building stones, the old fortress now forms the nucleus of a Uruguayan national park close to the Brazilian border (pages 640 and 641).

[illegible] world.

[illegible] stone [illegible] Buenos Aires [illegible] Brazilian [illegible] Montevideo [illegible] Uruguay.

There is another Uruguay, undreamed of in Hudson's day: the summer-colony Uruguay, [illegible] unbroken chain from Montevideo to the Brazilian frontier, about 200 miles.

Tourism Nation's Second Industry

Fostered chiefly by a spate of [illegible] from nearly beachless Buenos Aires, [illegible] trade has grown into the Republic's second [illegible]. Last year visitors spent more than [illegible] a week, and most bring more [illegible] the country.

A map published by the Uruguay Tourist [illegible] Punta del Este [illegible] Rambla [illegible] Eastward along the coast, the water becomes clearer and whiter until at Punta del Este [illegible] blue Atlantic breaks in heavy surf against the promontory.

[illegible] sheltered beach at Punta del Este [illegible] *Playa Brava* [illegible] stair ability or [illegible].

[illegible] Punta del Este [illegible] the small [illegible] Isla de Lobos, home of one of the two most

White Sails Frame the Tower of the Uruguay Yacht Club: Buceo

From the landward side the club's façade resembles a ship's prow, and the jutting balconies look like a liner's multiple decks.

important colonies of fur seals in the Southern Hemisphere. From Lobos the coast's most powerful lighthouse marks the entrance to the Plata with a flashing finger of light.

On December 13, 1939, the hundreds of fur seals and few sea elephants that inhabit Lobos must have seen the red flashes and heard the distant thunder of the naval engagement between the German pocket battleship *Admiral Graf Spee* and the British cruisers *Ajax*, *Achilles*, and *Exeter*.

The wreck of the *Graf Spee* still lies where she was scuttled in shallow water off Montevideo. With Prof. Juan Lagomarsino I sailed to the wreck one evening from the Uruguay Yacht Club, a tall white building with balconies like a bridge and a profile like the cutwater of a ship.

Uruguayans Love Yachting

With more than half their national boundary made up of navigable coastline, the Orientales are seagoing people. Ardent yachtsmen race their vessels up and down the coast and compete in international regattas, some as grueling as the Río de Janeiro-Buenos Aires race.

Don Juan was the only Uruguayan to beat Argentina in an international race. He is one of the country's leading yachtsmen, as well as a geography professor.

"My friend Pepe Gainza will lend us his schooner for the run," he had said. "He and I limp on the same foot"—a way of saying "we have the same hobby."

As we sailed toward Montevideo from the little port of Buceo, we saw the black outline of a freighter, immobile as if nailed to the orange sky. A small pilot boat scuttled about like a water bug.

Suddenly the freighter gave three short blasts on her deep-toned whistle, milky water churned up at her stern and she moved slowly off, laying a scalloped cloud of black smoke along the horizon.

Pointing, Don Juan asked, "See that last

buoy flashing off there to the left? We call that the Buoy of the Good Voyage. It's the last you see as you leave these shores.

"That reminds me," he went on, "I must telephone to find out the arrival time of a ship when we get ashore."

"Do you call the lookout on the Hill?" I asked.

"No, I'll dial 213, and the operator will tell me."

"You mean 'Information' lists ship schedules?"

"Oh, yes," said the professor. "And not only ships. This number tells you arrivals and departures of trains, airplanes, and buses; what drugstore is open in your neighborhood at night; notices of sports events; the weather; and what is showing at the local movie. If you hear a fire siren, 213 will tell you where the fire is!"

Later I learned of other services furnished Uruguayan telephone subscribers at no extra charge. A special operator on 214 answers the subscriber's telephone while he is on vacation, takes all messages, and refers callers to his new address. The same operator will also wake up patrons in the morning!

In a light breeze we sailed round the point and past Montevideo. Through glasses we could make out the white curl of breakers over the low-lying wreck. Slowly we drew near to all that is left of the *Graf Spee*.

Almost awash, the rusty hulk lies canted over, one gun still pointing to the sky. Seas swell and break over the wreck, dropping away to reveal the gaping black ports which an instant later spout fifty simultaneous jets of white water.

As we circled and started back to Buenos in the gathering darkness, Don Juan said: "For days after they blew her up, I could see the red glow from my apartment window. Shortly after the scuttling, divers salvaged guns, samples of armor plate and equipment, and sent them to England for study.

"A sand bank is slowly forming around her now; I suppose it will eventually bury her."

Santa Teresa National Park

Beyond Montevideo the sandy coast, dotted with tidal lagoons, runs to Brazil.

Almost at this frontier, the ruins of a big fortress mark the old division between the lands of Portugal and Spain.

In 1750 a treaty signed in Paris advanced the line of Portuguese possessions in Brazil farther to the south. To defend the new border, Portugal began to build Santa Teresa Fortress.

Designed in the style of Vauban, celebrated French military engineer, the star shaped fortress was captured by the Spaniards, who redesigned and enlarged it.

Later the fortress was taken and lost successively by the Portuguese, Spaniards, Brazilians, and Uruguayan patriots before it fell finally to the newly constituted Republic of Uruguay (pages 638 and 643).

Spanish and Portuguese possessions changed hands rapidly in those days. The Director of National Parks, Don Horacio Arredondo, with whom I drove to the fortress, said, "The Spaniards won the fights, and the Portuguese gained the diplomatic victories."

Don Horacio first proposed the restoration of the historic redoubt after World War I. Now a rebuilt Santa Teresa forms the center of a magnificent national park, with forests, bathing beaches, camp sites, flower gardens, and a zoological park.

The Highest Point in Uruguay

As we drove eastward out of Montevideo, the country grew more rolling until, near Piriápolis, we saw the highest point in Uruguay, the Cerro de las Animas, 1,644 feet.

Near Santa Teresa isolated clumps of feathery palms appeared in the fields. Soon they closed ranks and became a solid forest.

"We do all we can to preserve the palms," said my companion. "Unfortunately, cows eat the young plants and shoots, and since cattle were introduced into Uruguay in large numbers no young palms have grown up."

The stately trees are long-lived, but local people frequently defy the law by cutting them down to make palm honey. Felling the tree, they lop off the top and lay the trunk on an incline, top down.

Boiling off the water from the sap that drains out, they get a little more than two quarts of honey in return for the sacrifice of a whole tree.

Santa Teresa stands on an eminence, in an ideal position for defense. Sand dunes and beaches lie before it, and behind stretches the sedge expanse of the Bañado de Santa Teresa, an area of marsh and inundated land. A shallow tidal lake, one of several along the coast, guards the southwestern flank.

About the middle of the last century the fortress was totally abandoned. Sand dunes moved slowly toward the walls and people took stone from the ramparts to use in building. The dunes had to be anchored with grass and the walls restored.

When the grass had halted the march of the dunes, planners planted shrubs, then trees literally by the millions, among them 70 kinds

Uruguay's Classic Capitol Rises at the End of a Broad Montevideo Avenue

[illegible]

of eucalyptus and 27 varieties of palm. Groves of pines grow close to the beaches.

As we walked through the cropped grass of the gently rolling pastures, fat red contented cows regarded us thoughtfully. Teruteros, a kind of plover (*Belonopterus chilensis*), started into flight.

Little burrowing owls sat on the ground and stared at us in the blazing sunlight. Overhead, carunchos wheeled.

The caruncho, a species of caracara (*Polyborus plancus*), is an undecided bird; it could not make up its mind whether it wanted to be an eagle or a vulture. It kills live prey, but lives mainly on carrion. Ornithologists call it an aberrant falcon.

Feather Dusters of Ostrich Plumes

I noticed something moving in the tall grass. It looked like a row of upended golf clubs slowly moving along. The golf sticks emerged as long-necked ostriches (*Rhea americana*) and stalked sedately about.

Smaller than the true African ostrich, the rhea lacks the beautiful tail plumes of the larger bird. Ignominiously, the rhea's tail feathers are used to make feather dusters.

Gauchos used to hunt the ostrich with *bolaadoras*, the Indian weapon made by tying two or three stone balls to connected leather thongs (page 639). The horseman whirled them around his head and let fly at the legs of the quarry—ostrich, cow, or man. They wrapped themselves tightly around anything they struck and brought it down.*

So fiercely did the original inhabitants of Uruguay fight the European settlers that today not a pure-blooded Indian remains. Particularly ferocious were the Charrúas, whose last survivors were sent to Paris in 1832 and 1833 as subjects for ethnographical studies.

From the edge of the dunes we looked down on the white sand beach that runs without a break to the Brazilian line. Fishermen with long rods cast into the surf for giant rays.

Farthest North for Penguins

"Sometimes, in the spring," my host said, "the current that sweeps north from Cape Horn and the Antarctic Continent brings hundreds of penguins to these shores. We suppose they are blown north by unusual storms; most are stunned or dead by the time they reach here."

A northerner must get used to the idea of cold coming from the south and to January being the height of summer.

In the park administrator's lodge, Don Horacio showed me paintings of gaucho costumes and life of the last century.

Many Uruguayan painters, notably Juan Manuel Blanes, painted scenes of the early Uruguayan countryside, much as Frederic Remington and others pictured our own vanished West.

"There were three principal periods of gaucho dress," he said. "Both of the early costumes were called *chiripá*." "This was a diaper-like nether garment that passed between the legs and fastened at the waist, to hang loosely at the sides.

"The primitive chiripá existed from about 1500 to 1840 or so, the second chiripá was used until about 1880 or 1890. From then on the *bombacha* became fashionable" (page 640).

Bombachas are loose, baggy trousers fastened at the ankle; Uruguayans wear them looser and fuller than do Argentines.

"Now," Don Horacio said sadly, "breeches are beginning to replace the bombacha."

Cowboys in Berets

Curiously, the flat-crowned felt hat of the gaucho, worn over a head kerchief, has given way to the Basque *boina*, or beret (page 635). Possibly because of the influence of the large number of Basques in the country, most cow hands wear boina, sash, and rope-soled canvas shoes with the bombacha (page 641).

The gaucho rarely wore boots or shoes. He wrapped his feet and calves in leggings of raw colt's hide with the hair on. Bare toes protruded, so that the big toe could grasp the brass ring or T at the end of the stirrup leather.

"Some of the old boys, from riding so long in this fashion," said my host, "looked like parrots when they walked, with the big toe standing out nearly at right angles."

On the savannas where wood is rare, cow dung furnished the only fuel available to the gaucho. In fact, so scarce was wood of any kind that walls around wells and other low fences were made of cows' leg bones, and horses' and cows' skulls formed the traditional chair of the gauchos.

Rough, self-reliant, quick-witted, and superb horseman, the gaucho was as handy with a guitar as with a knife. He liked to engage in bouts of couplets, sung to a guitar, while relaxing in a *boliche*. These little general stores served liquor from behind an iron grill.

Some boliches even had a kind of porticulus between the bar and the door. If a customer became belligerent and refused to pay, the barkeeper would unfasten a rope, and clang

* See "Life on the Argentine Pampas," by Frederick Simpich, NATIONAL GEOGRAPHIC MAGAZINE, October, 1[illegible]

Great Falls of the Uruguay River Block Navigation 200 Miles Upstream

From [illegible] to shore the [illegible] interest [illegible] the [illegible] Argentina, the river [illegible] the Rio de la Plata

down would come the iron gate to hold him prisoner until the authorities arrived.

W. H. Hudson, Argentine by birth but of New England parents, made the gauchos live again in his book about Uruguay, *The Purple Land*.

All Uruguayans love the colorful gauchos of their country's past, and the highest compliment they can pay you is to say you are many gauchos.

Just beyond Santa Teresa, the border town [illegible] straddle the international line. One [illegible] street is Uruguay; the other Brazil.

Ombú a National Symbol

Near here, a small fort, San Miguel, part of the colonial border defense, now operates as a national monument. Here the Government keeps an exact duplicate of the old ox wagon of the plains.

Corresponding to the covered wagon of the American West, the high-wheeled wagon with rounded top was, with the passenger diligence, the only vehicle that crossed the expanses of shoreless plain.

In Montevideo stands a bronze monument to this piece of the Banda Oriental's past. By the noted Uruguayan sculptor José Belloni, it is one of the most beautiful public monuments I have ever seen (page 614).

Many wars have raged about the frontier area. The Uruguayans have always been known as good, tough soldiers. They tell a story about a General Medina, who fought [illegible] in the 19th century against the Portuguese. Leading a cavalry charge against the [illegible], he shouted an order:

"Take off your ponchos, boys; it won't be cold in the next world!"

A line drawn from Montevideo to Rivera in the north divides Uruguay almost exactly in half.

I flew to Rivera one morning, crossing at [illegible] on River Yi, beloved of the hero of *The Purple Land*.

Vultures Love This Dried Beef, but Can't Touch It

A Uruguay countrywoman hangs meat aloft as if to invite aerial raiders. She knows that native carrion birds must sit to eat. One of these birds is the caracara, which, unable to dwell on an eagle's or a vulture's bill, hunts prey and waylays the dead. (page 6

Not far beyond, the Rincón del Bonete power dam backs up the Río Negro into a tremendous ramified Lake (page 646). The Negro, largest river within the country's borders, traverses all of Uruguay from east to west before it empties into the Uruguay River.

The big hydroelectric project of Rincón del Bonete assumes particular importance because Uruguay has no oil or coal, except a very low-grade lignite, and must import fuel. Two power lines already carry 75 percent of the potential power to Montevideo, 150 miles away. When fully operating, the project will generate nearly 500 million kilowatt-hours of electricity per year.

Amethysts in Hollow Stones

Near Rivera, agate and amethyst occur in geodes, rounded stones that when broken open reveal a miniature cavern of glittering six-sided crystals of clear quartz and violet amethyst.

In the yard of one house in Rivera I saw walks bordered by crushed amethysts, almost bleaching white in the hot sun.

No one knows what causes the color in amethysts. It may be manganese, say some; or possibly it has an organic source. If exposed to strong daylight, the violet color slowly fades.

Ancient lava underlies this area. A gem cutter told me how the geodes were formed in it.

"When the lava cooled, mil[illegible] in the p[illegible] like the holes in swiss cheese.

"Somehow, water either filtered through or condensed in these hollows, depositing in the hole these layers of mineral, first agate, then quartz, and finally in some cases amethyst.

He told me that all three are basically the same substance, with a hardness of 7 in the scale w[illegible] the diamond is 10.

Solid stones made up entirely of agate show rings of gray

Uruguay's Large Spanish Population Includes Many Bearded Patriarchs

[illegible]

white, red, and brown when sliced lengthwise. Cutters polish such sections to make ash trays [illegible]

[illegible]

[illegible]

When I asked where the [illegible] I [illegible] the [illegible] were [illegible] the [illegible] [illegible]

[illegible]

golden gems by heating the [illegible] in a fire made of cow dung. [illegible] in Bolivia [illegible] to crackers, they put in the crystal [illegible] they put it [illegible] and there let it [illegible] for two or three days.

Beef Roasted in the Hide

[illegible] River we [illegible] the [illegible] [illegible]

an exciting aroma into the air. Naturally, the bird is not eaten; it merely serves to seal in the juices.

While we ate at a long table under the trees, ranch hands sang and accompanied themselves on the guitar.

We flew west to the extreme northwest corner of Uruguay where, at the confluence of the Uruguay and Cuareim Rivers, Brazil, Argentina, and Uruguay meet; then we flew south along the Uruguay to the city of Salto.

Looking down on the level green of open country, we saw dark rectangular groves of eucalyptus trees. Planted to give shelter to cattle during windstorms, the regularly spaced oblongs looked exactly like chips strung out in convoy over the sea of grass.

Salto vies with Paysandú, 65 miles downstream, for the honor of being the second city of the Republic. At latest count, Salto had a slight edge.

Orange and tangerine groves stretch in geometric patterns about the white houses of Salto. Vegetables ripen more quickly here than in the cooler climate of Montevideo.

Salto at Head of Navigation

The Uruguay River, flowing southward from Brazil, separates Argentina from Uruguay. At Salto, 200 miles from where the Uruguay empties into the Río de la Plata, river steamer navigation ends. A chain of falls and rapids bars navigation.

Motor launches ferry passengers across the wide Uruguay between Salto and Concordia, the city on the Argentine shore.

With Salto city officials I attended a rededication of the monument to Giuseppe Garibaldi, Italian patriot and idealist. Garibaldi wrote a little-known chapter of his adventurous life in Uruguay, when in 1846, at the head of his Italian Legion, he won two battles that helped secure the independence of the Republic.

While Salto's people, many of whom are of Italian descent, gathered at the Garibaldi monument, I noticed what seemed to be dark smoke plumes on the horizon. Slowly the clouds attenuated into wavering lines and came toward us. Then, with a whirring and rustling, millions of locusts swarmed between us and the sun, glistening like metal against the blue sky.

My companions pointed to rows of citrus trees. Most had been stripped to the bare branches, while the grassy green foliage of other rows remained untouched.

"The whole ones are the tangerine trees," said one man. "Locusts don't like their leaves; too bitter."

Locusts periodically sweep south from the Argentine and Paraguayan Gran Chaco to ravage Uruguay and the adjacent Argentine provinces. Airplanes and helicopters spray insecticide over wide areas in a successful war against the devouring insects.

A short distance above the [illegible] a spectacular series of falls and rapids, the Salto Grande (Great Falls), stretches from shore to shore.

In low water scores of roaring cascades pour over worn black basalt and discharge into long gorges (page 633).

The amber water swirls and foams through the canyons, forming powerful whirlpools in the fast current.

Fishing at Great Falls

Here, in the glassy glides above the lips of the falls and in the turbulent pools below, the dorado loves to lie. *Salminus maxillosus*, one of the world's great game fishes, looks like a yellow salmon, with finely pencilled lines of broken dots along its sides (page 633).

These voracious predators sometimes reach a weight of 60 pounds, though they average much less.

At the Salto Grande the Uruguay Tourist Commission maintains a ranch-style guest house. From here I fished for dorado with a friend.

As our boatman rowed us along the foot of the falls, we cast big spoons into the foam-flecked eddies. Masses of floating spume lay like beaten egg white in the backwaters, and the boat bent back from the black rocks.

Suddenly an electric shock leaped along my rod. One hundred yards of 9-thread line melted from the reel, and downstream, so remote that it seemed to have no possible connection with me, a great golden fish leaped and fell back with a smash.

The incredible shock and downstream dash occurred almost simultaneously. Practically nothing can stop a dorado in this initial rush. They fight hard, leaping repeatedly as long as they are in fast water. The biggest I captured weighed just under 20 pounds and took 18 minutes to bring to gaff.

The Colorful Dorado an Epicure's Dish

When fresh from the water, the dorado makes a striking picture. Orange-red fins and tail complement his over-all golden-yellow coloring.

The head and gill covers appear to be plated with amber tortoise shell, and the big mouth shows wicked triangular teeth that cut steel leaders, and sometimes even big hooks with the ease of wire cutters.

Uruguayan Transportation Never Sees Not More than Two Cow Cows

[illegible]

[illegible]

[illegible]

[illegible]

Everyone Drinks Maté

[illegible]

Commonly in the cities and towns shortly after sunrise I would see men, still in their pajamas, standing in their doorways and pensively sucking mate out of a pear-shaped or flat-sided gourd.

They call the gourd *mate*, also; the silver drinking tube is the *bombilla*. It takes so long for the liquid to seep through into the perforated bulb on the end of the tube, that drinkers acquire a patient, thoughtful air while sipping mate.

Friends showed me the proper way to prepare and drink it. Soon, like them, I carried my own mate and bombilla with me when traveling and called for hot water the first thing on awakening in the morning.

To prepare mate, I first placed the bombilla in the gourd, then I filled the gourd about two-thirds full of *yerba*, dried leaves and twigs of the mate tree. I added cold water to saturate the leaves. Now I poured in very hot water, and waited.

It takes time for the liquid to seep slowly into the perforated bulb on the end of the tube. Even then, I could draw up only the small amount in the tube. After that, I waited for it to fill up again.

And so the mate drinker goes on, periodically adding hot water from a small kettle, or, if he lives in the city, from a thermos bottle with a specially perforated stopper.

In its natural unsweetened state, mate tastes like green tea, more or less bitter and astringent, according to the variety and source. The herb is intensively cultivated, particularly in northern Argentina, but much of it still comes from wild trees in southern Brazil and Paraguay.

Men Drink the Bitter; Women the Sweet

Men usually drink bitter mate; women like to add a little sweetening. Sometimes they even brew it in a pot, like tea. But confirmed mate drinkers will have none of this effete procedure.

On the cattle and sheep ranches the hands get up about an hour before dawn and sit tranquilly sipping mate while they await the sunrise.

After working all morning on the range, the cowboy or shepherd drinks mate at 11 or so, and then again at the end of the day (page 641).

"But," said my friend who was telling me about it, "there are some who pass the entire day drinking mate."

In the old days, the gaucho subsisted almost entirely on mate and meat—beef, kid or mutton. Apparently the mate supplied some of the elements needed to balance the diet, although the explorer Vilhjalmur Stefansson claims man can thrive on fresh meat alone if it contains sufficient fat.

Carnival Time in Montevideo

When I returned to Montevideo from up-river, Carnival had taken over the capital. All Uruguay joins in this festival with as much gusto as the Brazilians of Rio (pages 627 and 652).

Arches of colored lights spanned the principal avenue, from which traffic is cleared at night so that people may take part in the street procession.

At night most of the women are masked and in costume, and celebrants bombard one another with confetti and serpentines from floats or on foot.

Each section of the city erects a *tablado*, an outdoor stage decorated according to the ideas and abilities of the local talent.

On these stages perform mummers' troupes, musicians, and anyone who thinks he has talent. At the end of Carnival the city gives prizes to the most original and ingenious performers.

In the capital's theaters, hotels, and clubs big public balls are given, some starting in the afternoon and lasting until dawn. Usually three orchestras play in relays—a "fox," or American-style dance band; a samba orchestra brought from Brazil; and a tipica, which plays tangos, rumbas, and fast creolo waltzes.

Women go masked and unattended to these balls, which last not only the regulation three days of Carnival but also for another week.

I stood one night on the edge of a dance floor, watching the revelers dance by, their bright costumes a mass of changing color in the spotlights.

Sensing someone watching me, I turned to look into the dark face of a masque. It was a girl, her head completely covered with a sheath of black stockinet. Bunched and gathered cloth formed upstanding ears, and from eyeholes two bright eyes peered at me quizzically. Whiskers springing from each side of her mouth made her look even more pert.

We stared at each other in silence for nearly half a minute. Finally I asked, "Cat or rabbit?"

Looking as disdainful as two eyes can through black stockinet, she snapped "Bah!" and flounced off.

It would be ungallant not to let her have the last word.

Clothed in Old-time Gaucho Costume, He Sings at Iguazu's Pass

[illegible]

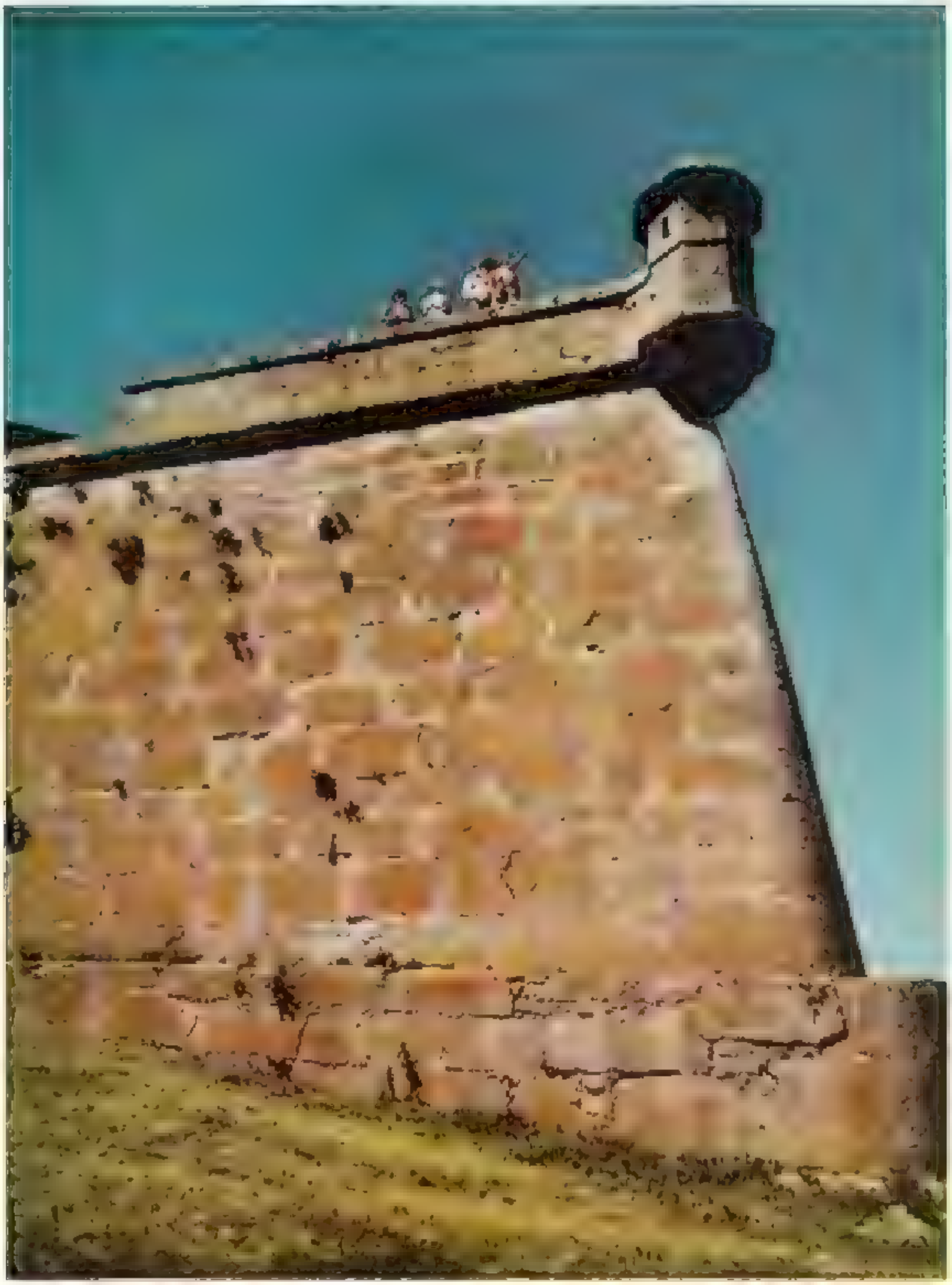
This Painting by a Noted Uruguayan Artist Displays Three Epochs of Gaucho Dress

Juan Manuel Blanes has chosen the costumes of [illegible] Mexico, [illegible] Colombia, Peru, Chile, Bolivia, Paraguay, Uruguay and Argentina.

Pass and Mate, Stimulating Teaklike Drink, Warms Patagonian Cowboys When Day's Work Is Done

Oxcart Drivers Liked to Camp Near a Shady Ombu When Crossing the Nearly Treeless Plains

At San [illegible]



Lazaros Like Orange Point Over the Walls of Santa Teresa

Located [illegible] the nucleus of a large national park. On the [illegible] protect Portuguese possessions from Spain. The bastion [illegible] Brazilians and [illegible]

Frozen in Bronze, Oxen Struggle to Release Their Wagon from a Mudhole—Montevideo's Famed Oxcart Monument

The Monument Comes to Life at San Miguel in This Reconstruction of Yesterday's Plains Wagon

Sleeping at La Estación de Monkey Corners on Ilaw Rosso Congress's Most Valuable Express

[illegible]

A Concrete Floor Impounds Waters of the Rio Nedro in Honduras's First USAID-Inducted Project

Waves Break Like Ocean Surf in the "Sweet Sea" at Coronado Beach

[illegible]

Mold of the Rue de la Paix Reducing the Water at Poitiers, Case of Poitiers Beaches on the Clouzeau River

[illegible]

Uruguay's President Opened Beef Trucks Round the World

Schoolgirls Combine Good Looks with Good Books

In This Olympic Stadium Ardent Montevideans Learn Watch the National Sport—Soccer

At Early Morning, Whitetail Cattle Await the Last Roundup at La Tableau Stockyards

Buyers and Sellers Discuss Beef on the Hoof at La Tableau Before The Drive to the Packing Houses

Les Danseurs Lourd Que Africain Rythmes Les Cadres Durant Carnaval à Montevideo

The Leaping Dancer—Eighty Hunter's dance a Season

Bakers' Brilliants Passed Wagons Eighty Montevideo Streets

The National Emblem Waves Before El Cerro, the Hill That Gave Montevideo Its Name

[illegible] Monte vid' eu I' (I see a h I'i—named [illegible] Cargo ships lie at anchor in the harbor. Beyond, El Cerro rises [illegible] fort atop the mount now houses a military museum and lighthouse.

The Fire of Heaven

Electricity Revolutionizes the Modern World

By Albert W. Atwood

IN the short space of a single lifetime man [illegible] electricity, and by means thereof has literally transformed the world.

Man lived on earth hundreds of thousands of years before he learned to use this strange, invisible force. The ancients knew that amber, whose Greek name was *elektron*, would pick up straws if rubbed, and they no doubt cowered before the lightning.

But it is only in the last 65 or 70 years that electric power has been substituted in ever increasing degree for the muscles of men and horses to perform thousands of laborious tasks and to provide us with a myriad of previously undreamed-of comforts, conveniences, luxuries, and pleasures.

Although electricity is a vital force in more than 40,000,000 homes, farms, schools, stores, offices, and factories in this country alone, and has probably changed our mode of life more than any single invention, its use has come to be taken for granted, much like that of water.

Seventeen years ago when Thomas A. Edison died it was suggested that a fitting tribute would be the turning off for just 60 seconds of every electric power plant in the country. But it was quickly realized that this magnificent tribute would also be a continental disaster.

What Power Means to Man

If all power were shut off, there would not only be darkness but the stoppage of all manner of vital industrial, commercial, agricultural, and domestic processes and functions. A large part of all our transportation and communication systems would cease, including telegraph, telephone, motion pictures, radio, television, and radar.

Without lights, signals, and dispatching systems, railroad trains would barely creep along, if they could move at all. Airplanes could not communicate in the air, nor could they land, and even automobiles would have difficulty in refueling. Naturally there would be no fire, police, or street signals.

Water supply and sanitation mechanisms would stop. Hospitals and surgeons would be terribly handicapped; compressed air and hoisting machinery in mines would not function; ships in distress would have no modern means of asking for help; vital scientific machines and experiments would be halted or ruined; weather-reporting apparatus and electric-eye devices would go out; crowded elevators would be trapped between floors; people would be caught in subways under rivers—there would be terror, panic, and death.

It is a curious fact that, although the use of electricity is well-nigh universal and indispensable, the thing itself is very difficult to define. The common saying is that while we know many of the things which electricity does and how to make it, we do not know what it is, even after two or three thousand years of experience.

An old but pertinent story is that of the unhappy undergraduate who at the very start of an early-morning class was asked by the professor of physics to define electricity.

"I knew last night," replied the unfortunate youth, "but I've forgotten it."

"What a calamity!" exclaimed the professor. "The only man in the world who can define electricity and he has forgotten it!"

One reason we find electricity difficult to define is that it is not directly available to us in Nature in a form in which we can use it: we cannot run a steel mill by touching an electric eel, or by rubbing a parlor rug on a dry day, the stiff hair of a cat's back, or a piece of amber.

True, lightning is very powerful, and there are 16 million lightning storms a year over the earth (page 657). But lightning is too erratic to use; as Juliet said to Romeo of their love, "Too like the lightning, which doth cease to be ere one can say 'It lightens.'"

Sources of Electricity

Fortunately, we know how to get huge amounts of controllable and usable electricity out of falling water and from the steam which comes from burning coal, and to a less degree from oil and gas.

Electricity is only one of many forms of energy, which in turn is merely a name for capacity to work, and no law of physical matter is more fundamental than that of the transformation of energy from one form into another.

True, water power, coal, oil, and gas are by no means the only things which contain energy; it is found in food, wind, the tides, the sun, and in breaking up the atom (nuclear fission).

But atomic power waits upon the solution

of many scientific and engineering problems. Even then, so far as we know, we would have only a substitute fuel to be used in generating electricity; the far more costly business of getting the current to consumers would remain as now.

In actual practice in this country two-thirds of our electricity comes from coal and most of the remainder from water power; nor is any radical change in this method of generating electricity expected for some years to come.

Whether it should be produced by water power or steam in any given place or case is a question of the availability and cost of the resources of the area—in other words, of geography.

Switzerland, Norway, and Maine have no coal or oil or gas, but are rich in water, or hydro, power. Northern Illinois and Indiana are in general too flat for falling water, but great coal fields are close at hand.

The world has spectacular potential water power in the Yangtze River Gorges in China, in the upper Nile, and in the St. Lawrence. The Niagara Falls, and the Hoover, Bonneville, Grand Coulee, and Tennessee Valley Authority Dams, as well as those on the Susquehanna, Connecticut, and other rivers, are among the important sources of power.*

In the high Sierras of California, far from centers of population, one company alone has more than fifty hydro installations, dependent largely upon the melting snows of the mountaintops.† The forty-niners had to have ditches to wash out their gold, and such were the small, crude beginnings of these great hydro developments.

But falling water does not and cannot supply the country's needs for power. In many parts of America hydro is most useful when it can be combined or tied in with steam; hydro must be "firmed up" with steam.

A water power plant may be more economical to operate, if not to build, than a steam plant. But droughts, on the one hand, and floods, on the other, may greatly lessen the usefulness of such plants.

Harnessing the Susquehanna

Only the St. Lawrence, of the North American rivers which flow into the Atlantic Ocean, has a larger watershed than the Susquehanna. Yet at the Conowingo Dam of the Philadelphia Electric Company the flow varies from 0½ million gallons a second to 15 thousand gallons. There is no way of storing the one extreme, and the other is far less than the flow needed to develop the capacity of the station.

Because of these inherent limitations, Conowingo runs at maximum capacity only half the time, although it is a valuable auxiliary source of power, especially during coal strikes. When there is ample water in the river, cities such as Philadelphia, Baltimore, and Washington economize by shutting down part of their steam capacity and drawing upon one or more of the Susquehanna dams.

One of the most unusual power developments in this country is at Holtwood on the Susquehanna. Here the Pennsylvania Water & Power Company has a hydro and a steam plant immediately adjacent to each other.

The steam plant uses finely divided particles of anthracite coal, which the Susquehanna has carried downstream in its passage through the hard-coal region, and which are dredged up from the river bottom near the powerhouse (page 662). Thus the same stream supplies water power and "river coal" to make steam power. Approximately two and a half million tons of coal have been recovered and used in this way.

"Where the Giants Live"

A small boy upon entering a modern powerhouse said that "this must be where the giants live." He was certainly right, especially as regards the fantastic appetite of a steam-generating plant for coal and water. For example, the Commonwealth Edison Company, of Chicago, one of the country's largest producers of electricity from steam, uses 1,000 tons of coal an hour.

Steam plants do not use water to drive the blades of their turbines, but they use such prodigious quantities of it for other purposes that they are nearly always located directly on the shores of rivers and bays.

The Philadelphia Electric Company has five important powerhouses on the Delaware River, and one of them alone pumps directly from the river 120 million more gallons a day than the total daily water requirements supplied by the city of Philadelphia to all its customers.

A new steam plant of the Pacific Gas and Electric Company on San Francisco Bay will use about two and three-quarter times as

* See, in the NATIONAL GEOGRAPHIC MAGAZINE "Along the Yangtze, Main Street of China," by W. Robert Moore, March, 1948; "By Belugas Down the Nile," by Willard Price, April, 1940; "Columbia (River) Turns on the Power," by Maynard Owen Williams, June, 1941; "Long River of New England (Connecticut)," by Albert W. Atwood, April, 1943, and "Around the 'Great Lakes of the South,'" by Frederick Simpich, April, 1948.

† See, in the NATIONAL GEOGRAPHIC MAGAZINE, "More Water for California's Great Central Valley," by Frederick Simpich, November, 1949.

Lightning, Unusual Electric Power, Strikes Squarely on the Washington Monument

[illegible] seen at the Monument's tip and elsewhere in the picture are lightning flashes [illegible] that [illegible] concentrated the emulsion on the film. Therefore, they appeared [illegible] when the picture was developed

[illegible]

Electric Power Turns Such Cities as Chicago into Nighttime Fairylands of Light

[illegible] the [illegible] lighted [illegible] that [illegible] Wrigley Building [illegible] The mammoth Merchandise Mart, [illegible] alone uses as much current for lighting as [illegible] The [illegible] Commonwealth Edison Company [illegible] generating [illegible] New [illegible] electric power [illegible] cooking and [illegible] homes.

much salt water as the supply of fresh water for all the needs of the [illegible] of San Francisco [illegible].

The steam itself is made from pure distilled water. [illegible] must be [illegible] condensed into water again after it passes the turbines and for this purpose vast quantities of [illegible] or river water are used.

In fact, in some of the country's largest cities so many power stations are drawing in and discharging river water that [illegible] would [illegible] the river [illegible] and thereby interfere with the operation of the [illegible] stations.

"On a Cushion of Steam"

It is a common saying among engineers that [illegible] electricity rides on a cushion of steam. [illegible] one of the [illegible] the present [illegible] of electricity in the modern steam turbine, in which high speeds, high temperatures and high steam pressures [illegible] to reduce the amount of coal needed to generate a given amount of electric current.

The moving parts of a turbine are nothing but a shaft of large diameter to which are attached a series of small blades of the windmill type, driven by steam instead of wind. The ordinary steam engine, as [illegible] by James Watt, is a reciprocating [illegible], with pistons moving back and forth, whereas the turbine is a continuous flow of rotary motion.

The principle of the turbine is like that of the [illegible]. Even [illegible] was known to the ancient Egyptians, but modern scientists and engineers had to devise materials to withstand the enormous speeds, pressures and temperatures. Watt had no such materials.

After the steam has delivered its power, it

Lighting of Baseball and Football Fields Enables Many More Fans to See Games

[illegible]

[illegible] temperature drops more than [illegible] from a pressure of [illegible] pounds a square inch to less than that of the air outside.

I was accompanying [illegible] powerful [illegible] Charles P. Steinmetz, [illegible] [illegible] as much work as 24 horses or 48 men slaves in the South could perform in itself.

The boilers in a modern steam power plant are as high as an eight or nine-story building and the turbines are so large that I have gone inside of one [illegible] which the moving parts had been removed for repair.

This was in the Fisk Street station of the Commonwealth Edison Company, at Chicago, the two [illegible] steam stations in America. Although in operation since 1903, it is still [illegible] power [illegible] from time to time.

The visitor to a modern power plant is [illegible] by the extreme cleanliness of the place [illegible] the fact that so few attendants are required. Pulverized coal is handled by machinery, and it takes only a few employees to watch the gauges, charts, and automatic controls.

Despite a small plant requires [illegible] many operators is a large one. The steady increase for economy drives the companies to build plants whose operating expense is as small as possible.

The Stimulus of Cinder

When I visited the Buzzard Point station of the Potomac Electric Power Company in Washington, D. C., about half the interior had been done over in the new color harmonies with green, cream, blue, and [illegible] taking the place of the old almost colorless or unpainted heavy machinery. Most operators prefer to work in the improved surroundings.

Her Nest Is "Wired for Electricity"!

A female black-chinned hummingbird feeds her babies in a tiny nest atop [illegible] porch in Independence, California. [illegible] nectar comprise the menu. Birds nested in this spot for 20 successive years.

But how does all this huge machinery generate electricity?

More than 150 years ago the Italian scientist, Alessandro Volta, discovered that an electric current was produced by putting plates of different metals in a chemical solution in a cell, a group of such cells being known as a battery.

Storage batteries, so-called, do not store electricity; they store chemical energy. They are used for hundreds of purposes, including automobile ignition systems, emergency lighting, doorbells, and flashlights. But where large quantities of current are needed, the use of chemicals in batteries is too expensive.

Fortunately, Michael Faraday in England and Joseph Henry in this country, more than a century ago and at about the same time, discovered the principle of induced currents. Faraday found that rotating a metal disk between the poles of a large magnet induces—that is, impels or influences—a current of electricity to get under way in the disk. This discovery is the basis of the whole vast modern power industry.

The process goes on in a dynamo, or as it is now more commonly known, a generator, which is attached directly to the turbine. The more powerful the magnet or magnets, and the faster the turbine shaft spins the coil of wire around the magnet, or the magnet around the coil, the more voltage is generated.

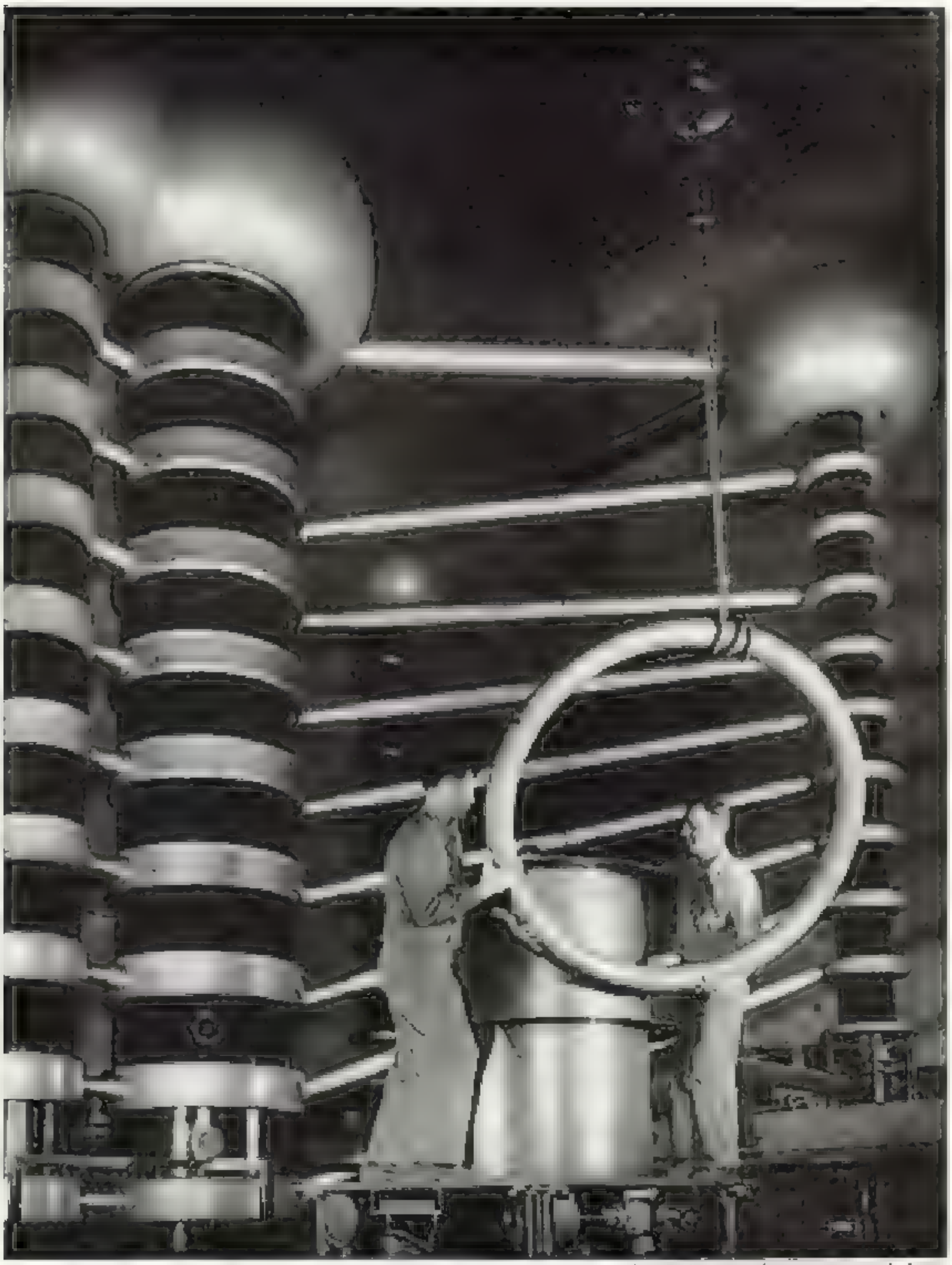
The Magic of Electrons

If we ask just why this process generates electricity, the answer plunges us deep into the mysteries of the cosmos. We are told that all matter—that you and I, my pencil and typewriter, the robin outside my window and the planets above—contains electrically charged particles of the atom, known as electrons.

Electrons are so small that it takes thirty thousand million trillion to weigh less than one ounce, and six million trillion of them must pass through the filament of a 100-watt lamp to keep it burning one second.

Naturally, our eyes cannot see the flow of electrons through a wire, which the scientists tell us constitutes an electric current. The wire looks no different, with or without a current, nor does it weigh any more or less.

We know, of course, that one of the most fundamental laws governing every activity or lack of activity in the universe is that energy flows only where there is a difference in potential; in other words, electrons move from a spot where they are numerous to where they are scarce. A simple analogy is that water seeks its own level.



Giant X-ray Equipment Aids Study of Safe, Efficient Use of Powerful Radiations

[illegible]

Waste Coal Washed down the Susquehanna River from Upstream Mines Is Dredged Up for Electric Power Use

Engineers in Harrisburg, Pennsylvania, [illegible] point in the river [illegible] Dalsen [illegible] Corporation [illegible] dam [illegible] by water power [illegible] to be [illegible] [illegible]

Electric Power Makes Sheepshearing Easier

A Huge Generator Helps Make Wind Tunnel Hurricanes

This Little Pig Went to the Electric Dog Waterer and Never Found It Frozen

[illegible]

Benjamin Franklin applied the terms "positive" and "negative" to electricity, but all that these two words mean is that unlike charges repel each other.

It was not so long ago that electricity was supposed to be a fluid and it behaves in many ways as it were; but whatever it may be, it is not a fluid in the ordinary sense. However, we still use nomenclature appropriate to the outmoded fluid theory, we speak of "electric current" and even of the "[illegible]".

Very rarely, a generator works in a manner perhaps elsewhere in the system of nature. Most of us will be satisfied to agree with the [illegible] of Bertrand Russell, the philosopher, that electricity is not a thing but a "[illegible]" is instead it is a way in which things behave.

Once produced, electricity becomes an extraordinary potential for clean, convenient, versatile and flexible terrestrial power for human use. The electric age is now one of the fundamental [illegible] of the Industrial Revolution, and its power must be used wisely [illegible] and over-[illegible] it for [illegible]

"Packaging" and Delivering Electricity

Electricity, on the other hand, can be sent over a wire with the speed of light, 186,000 miles a second, and is subject to unlimited [illegible] and almost perfect control.

The housewife does not want a whole waterfall or an industrial electric [illegible] to provide power for her toaster.

Oliver Wendell Holmes said that electricity was power "stripped naked." There is the story of the Independence manufacturer who did

not at first see the advantage of putting in electricity, but suddenly tumbled to the idea. "Do you mean it can go around corners?" he exclaimed.

But to deliver electricity is a costly business, with thousands of miles of copper or copper-coated wires, thousands of poles, and such mechanisms as substations and transformers to package the bulk product for size—that is, to step it up or down for use by individual customers.

In the distribution system of the Consolidated Edison Company of New York there are 165,000 tons of copper, mostly underground, and 175,000 tons of lead.

The Commonwealth Edison Company, of Chicago, has 9,112 miles of ducts under Chicago's streets, 22,531 manholes, 38,000 transformers, and 145,000 poles (page 658). Incidentally, a cedar pole can be climbed only about 75 times because after that the spur marks make it unsafe, and a new pole must be installed.

Unfortunately, electricity produced in powerhouses cannot be stored, like most commodities, but has to be manufactured and delivered instantly on demand any time during the 24 hours of any day in the year, in any quantity which the customer may desire.

You press a button and the light comes on. You gain the illusion that you have tapped a reservoir of electricity. But this is not so. What you have done is to telegraph the powerhouse and cause the generator to produce that much additional current for your use.

But since power cannot be stored, there must be a reserve or excess producing capacity to meet the maximum, or peak, load, the word "load" simply meaning the combined uses of all customers.

During the war new civilian construction stopped; yet the use of power has soared beyond all previous experience. Because it takes from two to four years to make and install turbine-generators, reserve capacities fell seriously low for a time. Now however, an enormous construction program, one of the largest of any kind in the world's history, is under way.

Controlling the "Load"

One must visit the load dispatcher's control room of a great power system to appreciate the degree of skill, ingenuity and vigilance required to meet not only the usual peaks of demand but also the "outages," which are interruptions of service due to accidents, breakdowns, fires, floods, hurricanes, explosions, earthquakes, and the type of snow sleet, and thunder storms which carry down miles of wire.

In such a control room a few dispatchers hold the life of a great city in their hands.

They stand between millions of people and the destructive forces of Nature, and they fight a daily, hourly, and by-the-minute battle to see not only that there is continuity of service but that the right amount of power meets the enormous and in part unexpected variations in demand. Here is one of modern civilization's most vital nerve centers and general headquarters.

A Room of Magic and Gadgets

The room is an amazing orchestration of mechanical contrivances and gadgets. There is a telephone switchboard; two-way radio systems; innumerable meters and charts; blackboards and blueprints; special clocks, "mechanical brains," and other automatic controls. But these only relieve the dispatchers from having their hands on the controls every minute; these men make constant decisions, some of life-and-death moment.

In the smaller companies, with only one powerhouse, a load dispatcher's control function may be performed in the powerhouse itself. If a company has several power stations, the control room is usually on an upper floor of the general offices.

One such room in which I spent a whole day has armor-plated walls and doors. Admittance is completely controlled from within. There is a kitchen and a bedroom, and also three auxiliary lighting systems, in case the main power supply should fail.

At 4 or 5 o'clock in the morning (in some companies the afternoon before) a daily estimate or program is made out for the system as a whole and for each individual powerhouse. The most efficient station is naturally given the most power to produce, and the others provide reserve.

The total estimate is based on the experience of past years and upon the latest Weather Bureau forecast of temperature, wind, cloud, and sunshine.

The least change in weather conditions calls for the instant rearrangement of a complex system of transmission lines and the redeployment of generating facilities. If the sun comes out suddenly in what has been forecast as a cloudy day, a whole station must be told to back down quickly; or, in reverse conditions, to come on.

In Washington, D. C., a few days before I visited the control room of the Potomac Electric Power Company, the estimate called

for 155,000 units of power at 6 a. m., and 157,000 were used. The 10 o'clock estimate was for 380,000 units, and exactly 380,000 were used. The 1 o'clock estimate was also for 380,000, but the sun came out and only 357,000 were called for (page 673).

I stood in the control room of the Commonwealth Edison Company, of Chicago, about twenty minutes before noon on a Wednesday in March, watching the many charts and meters. Suddenly the chief dispatcher said:

"Watch the noon drop, Mr. Atwood."

"What's the noon drop?" I asked in bewilderment.

"Don't you realize," he replied, "that we are just about to dump several hundred thousand units of power? Hundreds of thousands of factory hands and office workers will turn off their switches in the next two or three minutes. But most of them will be back at 12:30."

And, sure enough, the charts and meters took a terrific drop even as I watched.

The Geography of Power

Each locality has its distinctive peak load, annual and daily, depending upon climate, population concentration, and industry. There is even a difference in this respect between the east and west coasts of Florida.

In many northern cities the annual peak comes a few days before Christmas, at about 5:30 p. m., when the load is heavy for home lighting, cooking, and heating, for factories, stores, and offices, for transportation lines, and for Christmas-tree lights and toy electric trains.

Some companies report three daily peak loads in December, just before noon, between 2 and 3 in the afternoon and just before 6 p. m. On the other hand, in Washington, D. C., and the southwestern cities, the annual peak load now comes in summer because of air conditioning.

Washington's all-time peak was at 1:20 p. m. on July 14, 1948. Clear weather had been predicted and 450,000 units estimated. But a storm developed unexpectedly, and with extreme heat 486,000 units were needed.

A combination of extreme heat and darkness normally makes for a heavy load, but above 100° F. large employers close their factories, stores, and offices, and the power has to be stamped.

One important duty of the load dispatchers is to act as a clearinghouse for the switching off and on of equipment for repairs and maintenance work.

There must be close telephone and radio connection between the central control room, the power stations, the headquarters of the trouble districts, and the foreman on the job, to prevent workmen from going onto a piece of equipment at the wrong moment and thereby being electrocuted.

As I entered one company's control room at 10 in the morning, three men were at the phone and radio. There had been a serious fire in a large new housing development, and they were busy switching equipment around to make up for the "outage." Everything was normal within half an hour.

At noon I went out to lunch. When I returned, the three dispatchers were completely relaxed. One ate a sandwich, another wrote a letter, the third read a report. Suddenly the radio blared; the superintendent of a trouble district was talking to one of his foremen. "Were any of your men hurt on that last job?"

The dispatchers dropped what was in their hands and stood absolutely rigid. "No," came the reassuring reply over the radio, and the men relaxed instantly. One of them turned to me, sensing my inquiry, and said:

"I once sent a man to ground a high tension line, and he was supposed to report as soon as the job was finished. For some reason he failed to do so. I grew more and more nervous. Suddenly the phone rang and a voice from one of the stations said, 'I've got bad news for you.' My heart jumped. At last, after years, I had sent a man to his death. Then the voice said, 'No. 2 boiler is out again!'"

Regional Pools for Emergencies

In one of the large cities it is estimated that the 854,000 residential customers may expect an interruption in service for an average of 55 minutes about once in six years. Severe sleet and snow storms, hurricanes, and floods are the bane of the power companies, and it is sometimes necessary after a disaster for a company to borrow repair crews from a neighboring company (pages 667 and 670).

Great progress has been made in recent years, especially during World War II, in tying together independent and separate operating companies, as well as those under common ownership and management, into regional pools for interchange of power.

At the present time, power can be sent over wires economically only little more than a couple of hundred miles, but experiments are under way to see if it can be sent greater distances advantageously.

When Virginia ran short of fuel during a great coal strike, it naturally could not get power directly from New Orleans, even though

In Winter Storms Wires May Break under Sheer Weight of Ice or Sleet Coatings

[illegible]

[illegible]

Routing New York Subway Traffic: a Trackman Watches Train Movements by Lights

[illegible]

[illegible] Washington and Philadelphia are only 125 miles apart, but [illegible] by way of Baltimore.

Power on Loan

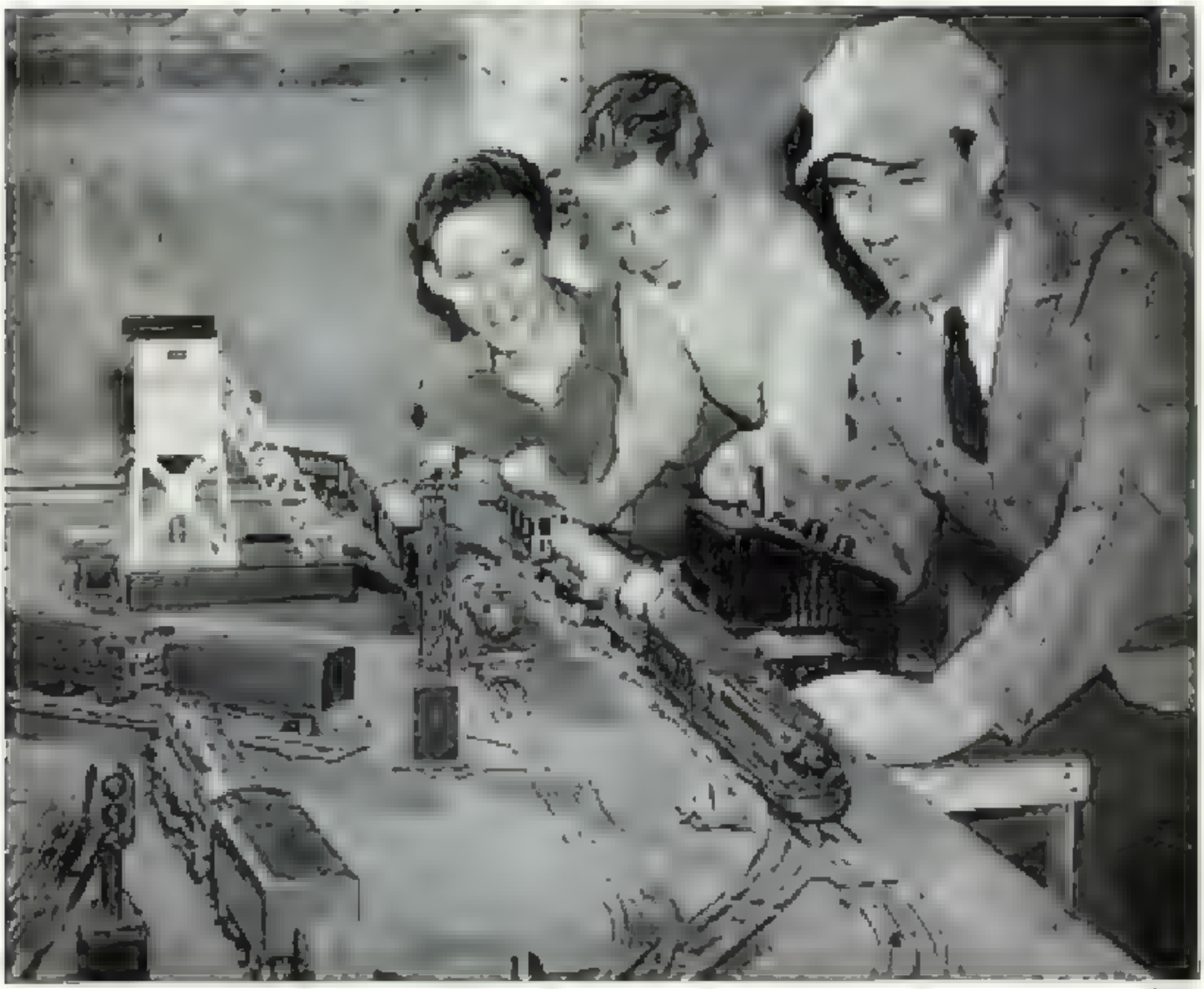
This form of pooling means that a company with a surplus of power can help one without [illegible]. This is possible because there are interconnections among the different companies and, in the matter of their power, [illegible] regards the power having which it is [illegible] received.

Also, of course, in the [illegible] in a [illegible] peak of [illegible] in the same time.

The Pennsylvania Power & Light Company, serves the industrial cities, textile and coal [illegible] and several [illegible] of Pennsylvania, Allentown, Wilkes-Barre, Lancaster, Bethlehem, Williamsport, etc. Its peak comes in the middle of the morning. In [illegible] cities, such as [illegible] or [illegible], like Philadelphia and New York, [illegible] peak comes in the afternoon.

Only relatively small quantities of surplus power are interchanged for long periods of time, as [illegible] equally [illegible] may be [illegible] at a whole season.

However, the [illegible] pooling of [illegible] and hydro power [illegible] of small [illegible] at many different points [illegible] a vast regional system [illegible] makes a steady flow of [illegible] possible and



Electric Trains Make a Fireman's Holiday for a Locomotive Engineer

[illegible] day of hauling Long Island Rail Road trains behind his engine Walter E. Wetnall [illegible] to fan his two sons in [illegible] with their miniature locomotives and cars. Use of electric power is [illegible] electric trains. One and a half miles [illegible]

[illegible] of disaster [illegible] provide the only service there is.

During the Connecticut River flood of March, 1936, [illegible] capacity rushed in emergency lines and spare equipment, restoring service until such times as the flooded power plants could be dried out and put back into use.

Dispatchers on the ground connected with relief areas wherever they could find a [illegible] door or were able to [illegible] power, [illegible] or messenger. These two of many similar messages from the logbook of the Connecticut Valley Power [illegible] during the flood are significant:

Waterbury reported trouble at Stevenson. The plant went out, and they think an armature went [illegible] Housatonic River is coming on the line and will pick up the load.

Ripley reports 41 inches of water on the operating floor at Windsor Locks. Water [illegible] on circuit breakers. Spare transformer [illegible] the way to Windsor Locks [illegible] temporary substation to carry Windsor Locks [illegible] circuit breakers go out of commission [illegible] and book has washed out."

Most electric [illegible] millions of them are to be found in homes, stores, offices, and factories, ranging in size from a few as big as a modern six-story [illegible] inches in diameter.

Generators and Motors

The generator and motor are similar in structure, each being the reverse of the other.

The generator changes mechanical power into electric current and the motor changes current into mechanical power.

A motor is needed to run a washing machine, a malted milk mixer, a juice box, a refrigerator,

Repairing Broken Wire, Emergency Crew Gets Word of New Job by Radiotelephone

Expert "[illegible]" can handle live wires safely using insulated gloves [illegible] and other safety devices and tools that will not transmit current [illegible] help direct [illegible] trucks from one job to another with no loss of time. [illegible] on electric power lines. Autos strike poles, and occasionally airplanes get tangled in wires [illegible]

a vacuum cleaner, a machine tool, and thousands of other things.

Electric clocks are electric motors that run at the same relative speed as the turbine-generators of an interconnected region. The clock vibrates or turns over with the same heartbeat, so to speak, as the turbine-generators. The revolutions of these great mechanisms are in multiples of 60, in accordance with our system of time—60 seconds to the minute and 60 minutes to the hour.

If the turbine-generators run faster or slower so do the clocks. In the winter of 1947-48 there was such a shortage of high mountain snow pack in central and northern California that it became necessary to slow down the turbine-generators to reduce loads, thus slowing down the electric clocks.

Timing Clocks to a Fractional Second

There must be constant harmony among the tied-in powerhouses of a region to keep the clocks accurate; if a large customer such as a steel mill suddenly slows down, there is a bump which requires instant attention.

But usually the clocks vary only a very few seconds from complete accuracy. As I left the load dispatcher's office of a great system for

lunch, the clocks were running four hundredths of a second slow; but when I returned, absolute accuracy had been restored.

There are in the United States approximately 1,000 stockholder-owned, business-managed, tax-paying companies, large and small, that produce and sell power. Numerous municipalities have their own plants and the Federal Government has the great Tennessee Valley Authority and the Hoover, Grand Coulee, and Bonneville Dams.

The stockholder-owned, business-managed companies supply more than 80 percent of the country's electric power. They are essentially local companies. They make and sell most of their product locally, use local labor, and have many local stockholders.

They bring in new industries, develop local resources, contribute to better farming, and sponsor local improvements.

United States Leads in Power Production

With only 7 percent of the world's population, the United States in 1947 produced about 45 percent of the world's electricity. This was about six times more than Russia, the runner-up in 1947, was able to generate.

Among the large producers of power in this country are the Federal Government's TVA and the Hoover, Grand Coulee, and Bonneville Dams; and such stockholder-owned companies as: Consolidated Edison, of New York; Commonwealth Edison, of Chicago; Pacific Gas and Electric; Philadelphia Electric; Detroit Edison; Union Electric, of Missouri; Public Service Electric & Gas, of New Jersey; Southern California Edison; Duke Power; Niagara Hudson Power Corporation; New England Electric System; Commonwealth & Southern Corporation; American Gas & Electric; American Power & Light; and General Public Utilities Corporation.

It has taken an extraordinary number of brilliant inventors, physicists, and engineers, as well as businessmen of courage, foresight, and imagination, to make possible today's almost universal use of electricity.

Investment in the industry is between 15 and 16 billion dollars, and the estimated number of investors is 3,000,000, not counting the indirect interest of scores of millions of life-insurance policyholders and savings-bank depositors.

Queen Elizabeth's physician, William Gilbert, gave electricity its name and was the first to carry on real experiments. Referring to Gilbert, Francis Bacon in his book, *Novum Organum*, proved a poor prophet when he wrote:

"For the electric energy (of which Gilbert and others after him have told so many fables) is only the energy excited in a body by gentle friction, and which does not endure the air."

Long after Gilbert's time, but also long before electricity was put to use, Benjamin Franklin learned an extraordinary amount about it, both theoretical and practical. Faraday and Henry (page 660) made the generator possible by their experiments in 1831. Thomas A. Edison not only ushered in America's age of light in 1879 but also inaugurated our system of central, or power stations in 1882. His notable improvements on the incandescent lamp climaxed more than a century of experiment in England and America and, with power coming from a central station, brought the lamp into wide use and cheap production.

Soon thereafter George Westinghouse made possible the transmission of electric current over long distances.

In very few industries have the names of inventors found such a prominent place as in the electrical industry. Several of its most important terms, such as watt, volt, and ampere, come from the names of the inventors Watt, Volta, and André Marie Ampère, and Edison's name is perpetuated in the titles of several of the largest of the modern power companies.

The story of the electrical industry is one of great technical advances. Not only has the industry accepted and adapted to its own use the new ideas of science, but it has made fundamental research in great laboratories an integral part of the industry itself.

One company which manufactures electrical equipment and apparatus employs 6,000 engineers and 900 chemists, physicists, mathematicians, and other scientists, and is responsible for 8,000 inventions in the past ten years. Another company spends $20,000,000 a year on research and engineering development activities.

Light and Civilization

Although the telegraph and telephone were the first big commercial users of electricity, it was the incandescent light that made people electric-conscious. We still speak of our electric-light bill despite our refrigerators, deep freezers, stoves, dishwashers, washing machines, vacuum cleaners, and other appliances, and many power companies still retain the word "light" in their names, no matter how large a proportion of their power is used for other purposes.

Progress in lighting seems to go hand in hand with progress in civilization, and the im-

provement in lighting proceeds apace, since there is an insistent demand for higher levels, or greater intensities, in illumination. It is said that homes, schools, stores, offices, and factories need from four to seven times more artificial illumination than they now have.

Returning servicemen not long ago forced the council of the Tesuque Indian Pueblo, 10 miles north of Santa Fe, New Mexico, to wire for electric lights. One faction of a group of Pennsylvania Amish, the fundamentalists, moved to a new location because another faction, the modernists, insisted upon having electricity for lighting, although even the modernists drew the line at the use of power!

Nearly two billion electric lamps are produced in this country annually, and one company alone makes more than 10,000 different kinds and sizes of lamps.

Amazing Variety of Uses

The electrical industry is comparatively young and new, and yet its growth has been in giant, breath-taking strides. The use of one appliance generally leads to another, and as appliances become cheaper and more reliable there seems no limit to their variety and extent of use.

Especially since the close of World War II the whole world has become electric power hungry, with Western Germany and the 16 nations in the Marshall Plan proposing to install 31,826,340 new horsepower of generating capacity. As of August 1, 1948, the central station generating capacity in the U. S. was 54,293,205 kilowatts, or 72,752,894 horsepower.

The striking thing about electric power is the way it weaves itself into the whole fabric of our lives; consequently, this puts an increasing responsibility upon those who generate and distribute it.

The housewife might get along without an electric curling iron, toaster or even vacuum cleaner and dishwasher. But electric power turns the oil into the firebox of an oil furnace and ignites it. Thus, in winter, millions of householders in cold climates must look for the protection of their heating systems to companies that for the most part never thought of trying to promote the sale of oil furnaces!

In radio and television, in air conditioning, in familiar appliances and gadgets for home, office, and factory, and in numerous other ways, electricity plays an increasingly important role.

Just imagine a modern hospital or even a large modern doctor's office without electricity—that is, without light, X-ray (page 661), electrocardiograph, and the varied equipment for electrosurgery and physical therapy, including diathermy and the various kinds of ultraviolet and germicidal lamps.

If we go out on the farm we find several hundred applications of electricity, including milking, cooling, sterilizing, brooding, incubating, sheepshearing, silo unloading, feed cutting, soil heating, hay drying, corn shelling, feather picking, and germ and insect killing (pages 663 and 664).

Turning from the farm to our largest city, the Consolidated Edison Company of New York furnishes electricity for street, highway, park, and bridge lighting; traffic control signals; high-pressure water pumping for fire protection; fire and police alarm systems; for pumping for the city's water supply system and sewage disposal plants; for hoists in the docks; the Independent, or Eighth Avenue, subway system, the Third Avenue Railway, the New York Central, the New York, New Haven and Hartford, Pennsylvania, and Long Island Railroads in the New York area; the tunnels under the Hudson River at the Manhattan end; the telephone and telegraph companies; radio stations, movie theaters, libraries, schools; State and Federal buildings; hospitals; and the nearly 44,000 elevators, which carry 3 billion passengers a year in Manhattan alone; nearly 2,300,000 dwelling units, some 19,000 stores and loft buildings, 1,700 office buildings, and nearly 9,000 factory buildings, including some 26,000 manufacturing establishments.

Electricity in Strange Places

Electricity is used in surprising places in large quantities—at the David W. Taylor Model Basin, Carderock, Maryland; at the laboratory of the National Advisory Committee for Aeronautics in Cleveland, Ohio; and in the new Battery Brooklyn Tunnel in New York City, which will use for ventilation, lighting, traffic and safety control as much current as a city of 20,000.

We know, of course, that practically every factory and mine uses electricity in some form, that it has become an integral part of many of the greatest industries, especially the newer ones, and that it touches and assists in almost every product we use.

The low cost of electricity, the lack of domestic servants, and the constant rise in farm and industrial wages are steadily driving the home, farm, and factory to motorize or mechanize every possible operation.

Despite some recent increases in rates, due to higher costs of materials and labor, the

They Keep Close Watch on the Surging Electric Pulse of the Nation's Capital

[illegible]

[illegible]

Miracles of Electronics

[illegible]

[illegible]

[illegible]

[illegible]

When Electricity Fails, Civilization Reverts to Oil Lamp and Candle Days

[illegible]

While experimenting with the incandescent lamp in 1883, Edison observed that when he put a metal plate inside the bulb a current passed across space from plate to lighted filament. He made a note of the matter but did not follow it up.

Later on, other scientists found that the "Edison effect" was due to passage of electrons from filament to plate.

In fact, [illegible] of Edison's discovery, was [illegible] of mankind, say [illegible] one of [illegible] of science. Then in 1904 Sir John Ambrose Fleming, an English physicist, devised a detector tube; two years later Lee De Forest added a grid, or metal screen, which made the radio tube possible.

This is not the place to describe the miracles of electronics; the subject was treated in the NATIONAL GEOGRAPHIC MAGAZINE for October, 1945, by F. Barrows Colton in an article entitled "Your New World of Tomorrow."

But at almost every turn of [illegible] and [illegible] [illegible] the [illegible], and [illegible] triumphs, [illegible] for it. Like other [illegible] the [illegible] for the world.

How strange that nearly one hundred years ago Nathaniel Hawthorne should have written these words in *The House of the Seven Gables*:

"Is it a fact—or have I dreamt it—that, by means of electricity, the world of matter has become a great nerve, vibrating thousands of miles in a breathless point of time? Rather, the round globe is a vast head, a brain, instinct with intelligence! Or, shall we say, it is itself a thought, nothing but thought, and no longer the substance that we deemed it."

Sailing with Sindbad's Sons

By Alan Villiers *

With Illustrations from Photographs by the Author

Ever since I thrilled to my first sight of a dhow speeding down the Red Sea, I knew I could never be satisfied until I learned how the Arabs sailed their ships, where they went, and how they survived in a mechanized world.

A look around the maritime world offered nothing of interest to compare. In the Occident scarcely a fisherman was left without power, and few were the South Sea Island schooners that didn't leave the reek of Diesel oil astern.

Only the deepwater Arab, the odd Chinaman with his junk, the long-voyage Indian dhow, and the Makassar prau still went about their ancient seaways under sail.

So, having sold my own full-rigged *Joseph Conrad*, off I went to ship with the Arabs. I went armed with introductions to political agents and to sheikhs, and with visas filled with strange hieroglyphs. A ship owner at Aden arranged for me and an American companion, Hilgard Pannes, to ship in a tiny double-ended dhow.

I discovered that the Arabs speak of none of their ships as "dhows." These craft have five names—*sambuks*, *booms*, *baggalas*, and *zaroks*—depending on hull forms.

The *Sheikh Mansur*, to which I was assigned, was a zarook, built in the Yemen. She was lean and fast, and when I joined her at the little wharf at Marsa Aden, she had just loaded general cargo for Qizan, a small port on the Red Sea (map, page 678).

The ship was so overloaded, her midship rail only a few inches above water, that I feared the wash of a fast rowboat might swamp her.

Arabs Laugh at Foreign "Softies"

Arab sailors and stevedores on the wharf eyed Pannes and me with interest as we approached Ahmed, the *nakhoda* (master) of the *Sheikh Mansur*. Despite language difficulties, it became apparent that the nakhoda did not want us, no matter what the owners said. To all and sundry he shouted that his ship was without comforts for softies such as we.

"Look here," I said, "don't you worry about us; we're sailors."

Sailors? Two foreigners in white suits? Laughter swept the wharf.

At last we persuaded the nakhoda, and he marched us off to sign aboard. At the sight of us, pariah dogs on Ma'ala beach barked themselves hoarse. Across the harbor, sand shimmered under the Arabian sun. Behind us the pock-marked mountains, barred and bare, shut in the settlement. A Bedouin camel caravan, hauling firewood, shuffled past us. All along the beach Arab shipwrights repaired dhows and sailors sewed lateen sails.

At last we came to the waterfront police office, where we were entered on the *Sheikh Mansur's* outward manifest.

Bearded Pilgrim Comes Aboard

I got a Persian carpet (made in Birmingham) and bedded down on the ship's deck.

Early the next morning a bearded Indian holy man, bound on a pilgrimage to Mecca, came aboard.† This dignitary, wearing a Joseph-coat gown, was escorted by police, who wanted to make sure that he did not become a public charge in Aden. His luggage consisted of a kerosene can crammed with food. Of cash he apparently had none, and he later jumped ship.

That evening, with wind and tide in our favor, we sailed. This maneuver was accomplished by weighing the grapnel anchor by hand and then sheeting home the lateen sail, which broke out of its palm fronds and, catching the air, sent us bowling along.

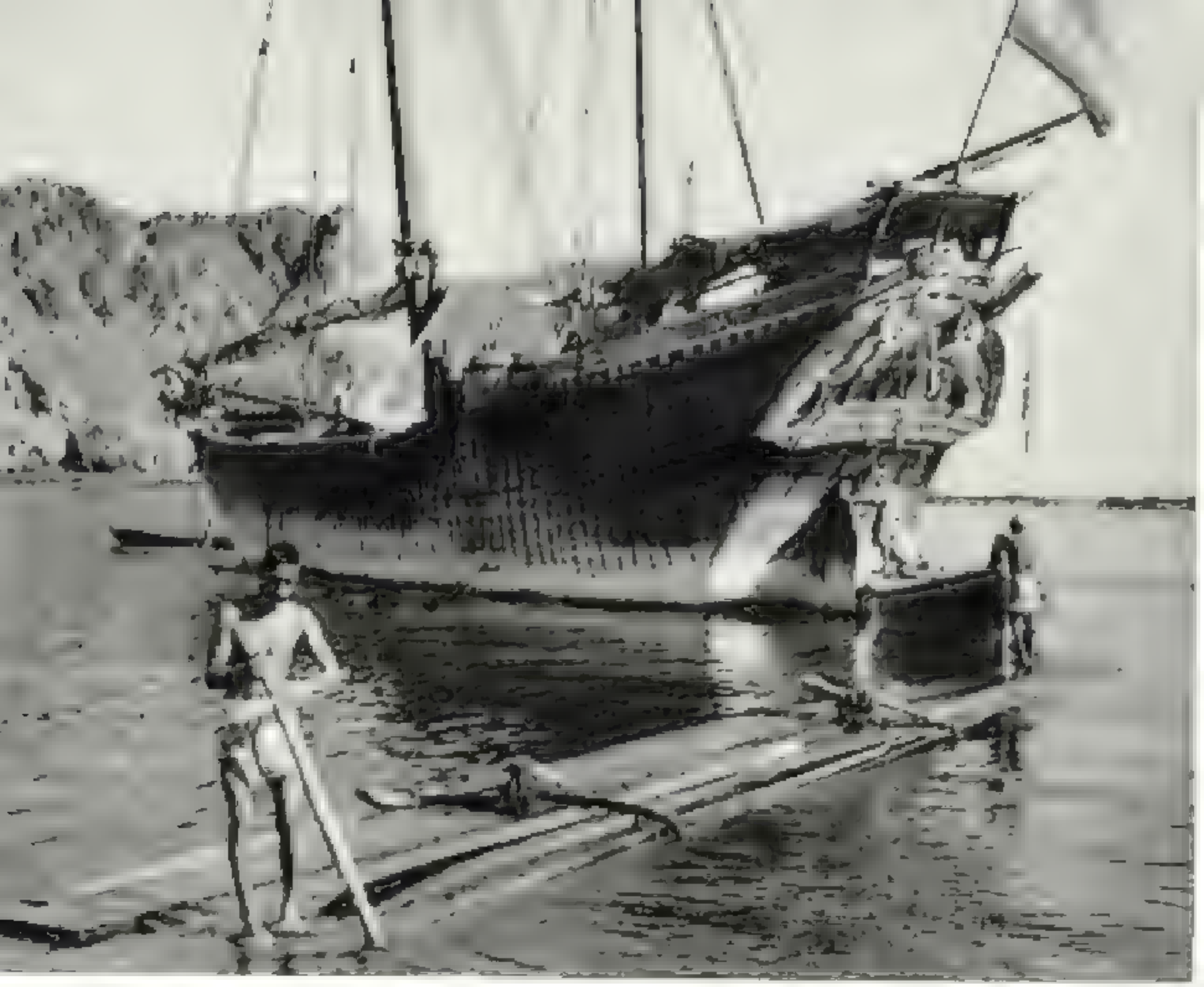
The nakhoda took the tiller (there was no wheel), and we slipped silent and lightness down Aden's bay.‡ We coasted along Arabia's arid shore, bound toward the strait of Bab el Mandeb.

Sheikh Mansur was deep-laden and stiff, and she rolled with a sudden jerky motion. Though the sun was blazing, it occurred to no one to erect a tent shelter.

* The author, an Australian journalist, served under sail in the Australian square-rigger. Later he became the owner and master of the square-rigged *Joseph Conrad*. In one life war he was a commander in the Royal Navy. To the National Geographic Magazine he has contributed "Cape Horn Grain Race," January, 1933; "Sleigh About," February, [illegible]; "Rounding the Horn in a Windjammer," February, 1931; "Where the Sailing Ship Survives (Aland Islands)," January, 1935, and "Last of the Cape Horners" [illegible]

† See "[illegible]," by [illegible], National Geographic Magazine, November, [illegible], and "Unbelieved Joins the Hajj," by Owen Tweedy, June, 1933.

‡ See "Rock of Aden," by H. G. C. Swayne, National Geographic Magazine, December, 1933.



Stevedores in Lumberjacks Cast Cargo Overboard, Lash It onto Rafts, and Pole It Ashore

[illegible]

[illegible] we were off again. [illegible] the rest week our routine was the same: we sailed by day and [illegible] at night. [illegible] were too dangerous, for the waters were full of [illegible] which we had no proof [illegible].

Needs Water made a lot of water, most of which drained into the [illegible] well [illegible] the mainmast. Into this [illegible] a man or [illegible] and [illegible] and bailed as [illegible] the pump [illegible] seams [illegible] to be emptied [illegible].

[illegible] along above the poles [illegible] effective [illegible] waves. Though the freeboard amidships was [illegible] more than six inches, we [illegible] little water over the sides.

We [illegible] one [illegible] the [illegible] rafting. We had to lower the heavy yard and then hend another smaller sail [illegible] amount of labor.

When the ship went about [illegible] the heavy yard had to be shoved [illegible] side of the mast [illegible] we lowered the sail [illegible] did not blow overboard.

There was no standing rigging. [illegible] sail was trimmed, a lot of the rigging had to be taken down and set up again.

Our Ancestors Sailed Such Ships

[illegible] the [illegible] being [illegible] of, and the [illegible] a few thousand dollars. For [illegible] triangular-type sail was the world's standard [illegible]. The square sail [illegible] with a mechanical engine [illegible] modern [illegible] beside the [illegible].

Bayan's Crew, Rejoicing at the Sight of These Grim Hills, Hoists the Kuwait Flag

Nearing home after the long voyage to Africa, the boom stopped at Matrah, on the Gulf of Oman, [illegible] [illegible] [illegible]

From the start I tried to learn all I could about shipboard routine, but for a while I was unable to discover any. The wind blew and the dhow sailed, and if Allah willed [illegible] arrived. Allah sent the winds good and bad. [illegible] weather the ship [illegible] Allah [illegible] it. Since Allah controlled all things, the men argued, there was no sense trying to predict the weather. As Allah took care of the future, [illegible] was unnecessary.

[illegible] five times a day for prayers [illegible] [illegible]. They [illegible] [illegible] [illegible] the sail. [illegible] [illegible] [illegible] [illegible] [illegible] really [illegible] [illegible] [illegible] [illegible].

Nakhoda "Sounds" with a Fishing Line

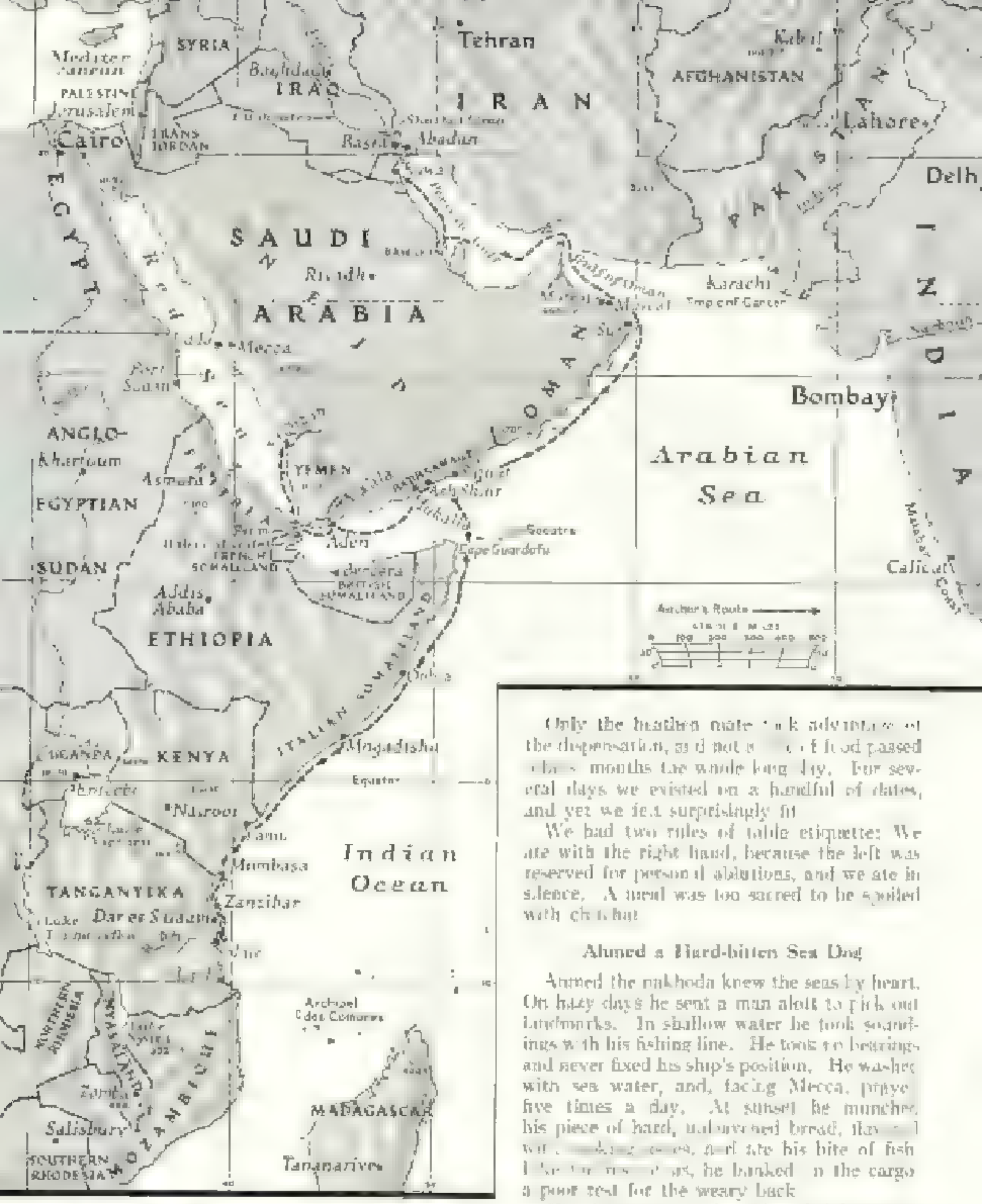
Though our small wanderer was badly overloaded and overcanvased, she sailed along pleasantly between trees and other hazards. *Sheikh Mansur* was as [illegible] as [illegible] in open water. Compared with her, a Tasmanian ketch was as lavishly equipped as the *Queen Mary*.

The *Sheikh* had no windlass and no gear [illegible] [illegible] [illegible]. Her [illegible] [illegible] [illegible]. There was no [illegible] [illegible] [illegible].

The only navigation instrument was an ancient, battered boat compass. Charts, barometer, log, and pump were missing. There was no device for telling time. We never even had lead for sounding, though sometimes the nakhoda used a weighted fishing line. No Arab aboard could write and only one could read.

Sea stores were [illegible] [illegible] when they were [illegible]. Our [illegible] was [illegible] by a [illegible] [illegible] over the stern. For cooking we carried a small sand box and a [illegible] [illegible] [illegible] wood was salvaged from Red Sea [illegible] and [illegible] from the sea.

Our [illegible] [illegible] became worse during Ramadan, the fasting month, when good Moslems are supposed to starve and thirst from daylight till dark. Sailors on the [illegible] [illegible]. [illegible] at sea they are excused to [illegible] their number of days at the voyage's end.



In These Waters Arabs's Argonauts Preserve Antiquity's Lateen Sails

Each year a date harvest sends the sailor merchants of Kuwait with strong down the Persian Gulf to East Africa's ports seeking the highest market. When the prevailing monsoon changes, bringing them a fair wind, [illegible] their [illegible] dhows with cargo [illegible] over Dhofar and return [illegible] shore shared the sea Arabs [illegible] the composite voyage of [illegible] Aden and ended in Kuwait.

Only the heathen mate took advantage of the dispensation, and not a [illegible] of food passed [illegible] mouths the whole long day. For several days we existed on a handful of dates, and yet we felt surprisingly fit.

We had two rules of table etiquette: We ate with the right hand, because the left was reserved for personal ablutions, and we ate in silence. A meal was too sacred to be spoiled with chatter.

Ahmed a Hard-bitten Sea Dog

Ahmed the nakhoda knew the seas by heart. On hazy days he sent a man aloft to pick out landmarks. In shallow water he took soundings with his fishing line. He took no bearings and never fixed his ship's position. He washed with sea water, and, facing Mecca, prayed five times a day. At sunset he munched his piece of hard, unleavened bread, [illegible] with [illegible] coffee, and ate his bite of fish [illegible] as he banked in the cargo a good seat for the weary back.

The skipper was a lean, bearded Yemenite [illegible] 55 years, 30 of them spent at sea. Jidda in the north, Salalah in the east, and Berbera in the south marked the limits of his wanderings. Red Sea waters were as familiar to him as the well-lit streets on any suburban [illegible] homeward way. He knew such things as he needed to know, and naught else bothered him.

At sea the nakhoda dressed always in the same clothes—a short sarong, gathered at the

waist and hanging to his knees. In the pocket [illegible] fastened beneath waistcoat he carried the ship's papers [illegible] and [illegible] together with [illegible] for [illegible] Beneath it is coat he wore a Japanese singlet, cotton and ventilated.

Carries His Amber Rosary Ashore

Above I kept his money belt laced tightly about the waist. [illegible] of which [illegible] was set [illegible] his head and [illegible] his [illegible] and [illegible] arm. He had no shoes. When going ashore he carried a [illegible] of [illegible]

The [illegible] stockings were [illegible] and his face knew more [illegible] than some bishops; but when [illegible] smile [illegible] at his crew in jerky [illegible] His oldest [illegible] sailed with him.

Four men and four [illegible] comprised the rest of the crew. They included a Turk [illegible] and the nakhoda's Negro [illegible] who knew neither his age nor the country of his origin. Slavery did not [illegible] the Negro [illegible] to Allah and [illegible] [illegible] crew members regarded their fellow man's bondage with complacency.

[illegible] we were [illegible] the Yemen [illegible] Sometimes we landed for the night on a cay where [illegible] opened for [illegible] and sting [illegible] the shadows.

[illegible] we spoke to [illegible] and bought a mess of fish for a handful of [illegible] [illegible] deck, but no steamer, [illegible] was not their home.

Like Monkeys in Treetops, Arabs Climb a 130-foot Yard

[illegible] end to end [illegible] years [illegible] These [illegible] [illegible] are [illegible]

Shows? *Bonner's Men Climb Barefoot.* **Caps?** **The Fiercest Sun Never Bothers Them**

[illegible]

In Awninged Ease Sits the Quartermaster Nonchalantly Puffing His Water Pipe

Navigation is simple on an Arab dhow. No one takes sights with a sextant; no one bothers with [illegible] [illegible] [illegible] [illegible] the [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] the wheel [illegible] [illegible] [illegible].

The [illegible] Sindbad [illegible] Qizan came in sight. Ahmed brought [illegible] [illegible] his [illegible] anchorage. [illegible] [illegible] [illegible] beneath the [illegible] [illegible] [illegible] passed [illegible] [illegible] [illegible]. [illegible] [illegible] [illegible] [illegible] [illegible] the [illegible] with [illegible] and [illegible] [illegible] (and cords) of Saudi Arabia. *Sheikh Mansur's* passage was done.

I saw Ahmed the [illegible] only once more, [illegible] Qizan's [illegible] [illegible]. He [illegible] [illegible] [illegible] suspicious [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] rated [illegible].

Before [illegible] [illegible] Ahmed [illegible] [illegible] [illegible], [illegible] [illegible] his [illegible] [illegible] [illegible] [illegible] [illegible]. In the presence of [illegible] [illegible] [illegible] [illegible] [illegible]!

Good [illegible]. I [illegible] well. He [illegible] [illegible] [illegible] [illegible] we [illegible] [illegible] [illegible] [illegible] [illegible] consideration. [illegible] [illegible] crew and his [illegible] little [illegible] [illegible] [illegible]. He was a good sailor.

[illegible] and I wandered back to Aden, where we found the Kuwait [illegible] [illegible] [illegible] [illegible]ing the new season's [illegible] [illegible] [illegible] [illegible] the [illegible] of the [illegible] Arab.

[illegible] Arab dhows I thought the big [illegible] [illegible] and [illegible] for [illegible] [illegible] [illegible]struction, seaworthiness, and [illegible] [illegible]. We counted [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] scraping and [illegible] [illegible] [illegible] [illegible].

It was not easy to get a passage in one of these dhows. The Arab, though hospitable to a fault, still dislikes the [illegible] in his [illegible] and hesitates to reveal too much of his business, [illegible] [illegible] [illegible] [illegible].

However, [illegible] [illegible] [illegible] [illegible] that I was a customs inspector and [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] a 115-ton Kuwait boom.

Bayan's Men Beat Drums, Sing Chanteys

Her [illegible] [illegible], from time to time, the [illegible] [illegible] [illegible] [illegible] other Arabs [illegible] [illegible] not [illegible] to be [illegible] [illegible]. Sometimes [illegible] was the [illegible], but generally the *[illegible]* (page [illegible]).

When we [illegible] [illegible] *Bayan* [illegible] her long-boat the sailors beat drums and sang chanteys, [illegible] [illegible].

[illegible] [illegible] Nasser [illegible] [illegible] [illegible] was [illegible] [illegible] a trading voyage along the coast of the [illegible] [illegible] to Zanzibar and

Boom, a Winged Galleon of Araby, Lies Becalmed in the Gulf of Oman Though She Flies Every Inch of Canvas

[illegible]

Barque Gets Under Way. Her Huge Lateen Mainsail Billows in the Monsoon, the Idle Mizzen Is Furled at the Mast

A Human Fender Descendants Pilgrim Dhows Arriving in Jidda, Port of Mecca

[illegible]

Zanzibar, and northward to the Persian Gulf. He assigned me to be his navigating mate, surely a nominal job, and gave me a six-foot length on the nakhoda's bench in the stern, but no chronometer or any charts.

I assigned to myself the tasks of learning all I could, of understudying the second mate, and looking after the health of all hands.

Like most Arab ships, *Bayan* carried no medicines or dressings; so I brought aboard all I could afford. I found plenty of use for them.

There's No Privacy Aboard a Dhow

Bayan, built of seasoned Malabar teak and boasting a crew of 27 men, was indeed a veritable liner compared with the poor little coasting *Sheikh Mansur*.

She was only four years old. Her mainmast was an 80-foot tree, and the lateen yard consisted of three Persian trees lashed together, the whole more than 130 feet long (page 679).

Our ship was double-ended with a high, roomy poop. Her gear was stout and good. The low, keen bow was surmounted by a long nose in polished teak, the mark of all Kuwait booms (page 683).

For the sake of any who may wish to take the voyage, I feel duty bound to point out a few disadvantages. A galaxy of insect and rodent life promised poor company.

Cooking arrangements were not much better than the little zarooks. All life had to be lived in full public view. Fresh water was kept in two wooden tanks into which all hands dipped at will; I was glad to see they seemed healthy.

Water, I learned later, was taken in the cheapest possible manner—from streams and presumably wells—and dumped into the tanks, which were never cleaned. A cast-iron stomach is requisite for any dhow sailor.

Sea Arabs Have No Use for Schedules

With a full cargo of salt, grain, tinned *ghee* (semiliquid butter), and cased goods, we set out on a December morning bound for Mukalla and Ash Shihr, in the Hadhramaut.*

Our ship was under the command of the mate, Hamed bin Salim, for Ali the nakhoda had gone ahead to Mukalla to collect a band of passengers.

I discovered that nakhodas often cheerfully left their ships and went ahead. Merchants as much as commanders, they had to purchase and sell cargoes and look for passengers.

As the ship carried her own goods for sale in the highest market of the moment, we found it impossible to forecast our ports of call. Not even the nakhoda knew precisely where he was bound.

For 13 days an adverse wind slowed our progress. During this time I became acquainted with the crew. *Bayan's* men from the start were kind to me, though they did show an embarrassing interest in all I did. Before long I was able to make friends despite my feeble Arabic.

To my regret, these Kuwaitis spoke a different idiom from the Yemenites aboard *Sheikh Mansur*, and for a while I scarcely understood a word.

The food, though rough, was better than the zarook's. We had aboard several Somali goats. Once a month one of these was killed, skinned, and thrown into the pot. Often we ate dried shark; I found it dreadful.

My stalwart companions were marvels of energy (page 680). The amount of singing, chanteying, yelling, grunting, and other noise-making they succeeded in creating would have exhausted the ordinary seaman. Almost every task they performed with a song and dance.

These Kuwaitis were magnificent specimens. Many were deep-chested pearl divers from the Persian Gulf. We had a number of freed slaves, huge muscular Negroes.

Sindbads Gloat Over Their Treasures

All these fellows obeyed orders on the instant and at the run, so that the hours' daily chores were done as effectively as a liner's.

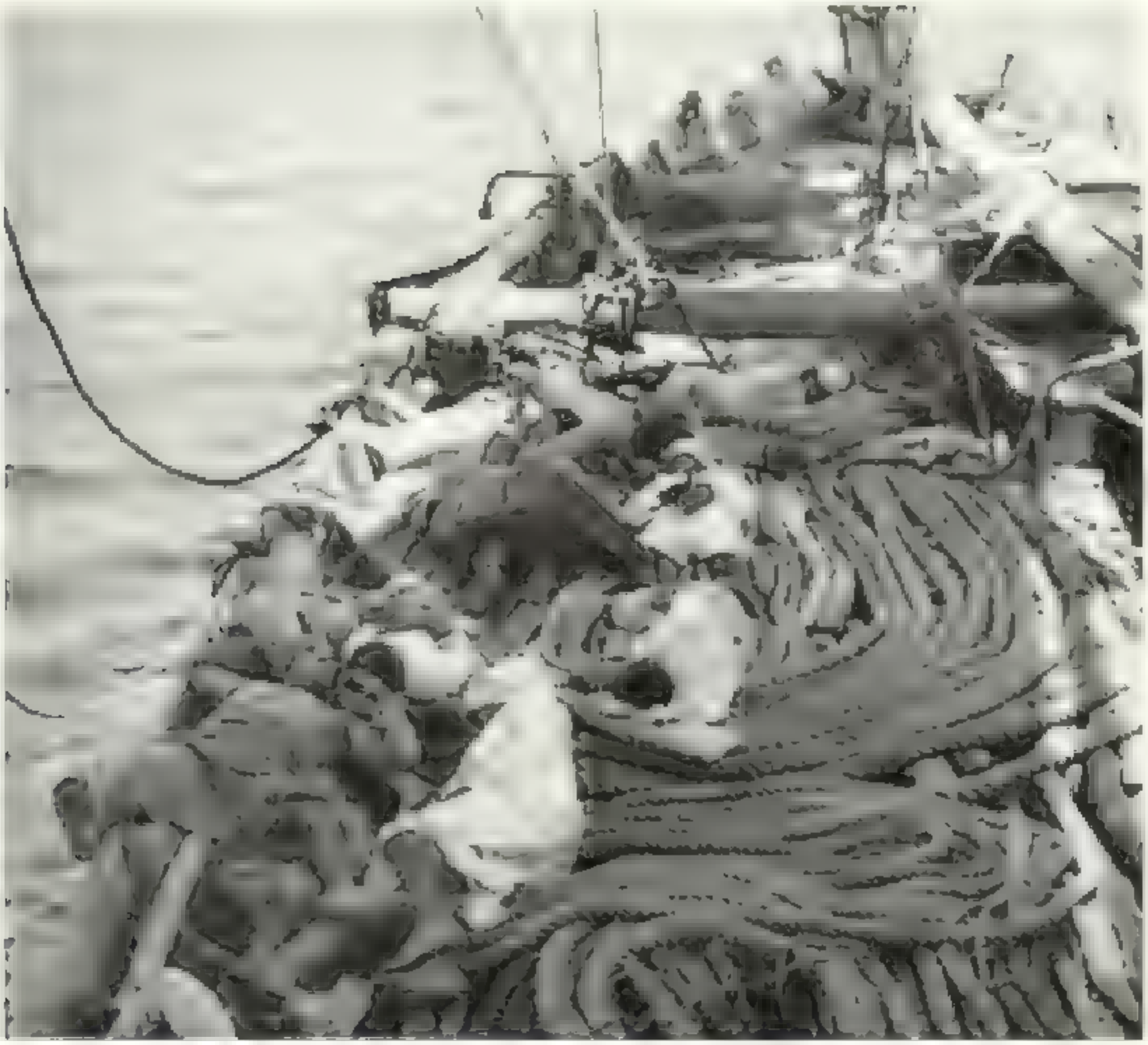
Every hand had years of experience. All had been at sea since boyhood, first on board Gulf pearlers, later on coasters, and finally on big booms and baggalas.

Paid on shares, the men took an interest in seeing that the vessel made a productive voyage. In addition, each man was allowed to bring a chest of his own wares, as in ancient times, when each merchant carried his goods and helped sail the ship.

These chests, teakwood boxes from Bombay and Malabar, stood ranged round the elevated poop, and in them lay all manner of cheap manufactured goods bought at Aden for sale to Somalis and Swahilis.

When there was no work afoot, the sailors loved to crowd up on the poop and examine the treasures in their chests, one man turning out his wares, his friends admiringly pawing them, guessing their price in Mogadishu, Salale, or Lamu. I could visualize Sindbad and his companions doing the same.

* See "Into Inner Hadhramaut," by D. Van der Meulen, NATIONAL GEOGRAPHIC MAGAZINE, October 1932.



Sea Arabs, Shaded by the Sail, Coil Upon a Cowhide Mattress the Only Bed They Know

[illegible]

[illegible] Mukalla. It was a grand place to look [illegible] and mosques squeezed between [illegible] to Somaliland, Africa.

I [illegible] that all the [illegible] Kidder [illegible] in quest of fortune, their own barsh land could not give them.

When Hamed remarked that we would land a hundred more passengers, I felt sure he was exaggerating. That was nothing, he said; [illegible] carried [illegible] on her previous voyage.

[illegible] women with them. These poor creatures were bundled into [illegible] fragrant place beneath the poop, unlit and unventilated. Here 14 pathetic, docile females [illegible] from [illegible].

A Walled City Facing the Sea

From Mukalla we went to Ash Shihr, [illegible] Arabian Sea. While [illegible] the open coastal waters [illegible] on board [illegible] hung their belongings over the [illegible].

Some of the Hadramaut Arabs are [illegible] seasoned travelers, having [illegible] Java, Syria, Mombasa, and the Sudan. Others

were unsophisticated, wild Bedouins leaving their desert homes for the first time. Gaping at every activity, they never became accustomed to shipboard life.

They were a tough-looking lot. As I watched them milling about the deck, mingling with the mob we already had, I worried about our water supply, sanitary conditions, and my own precious health.

Each man cooked his evening meal on the deck. I was still wondering where all 170 of us were going to sleep when I saw the newcomers, one by one, selecting deck-space banks under the stars. Not [illegible] of a bed bunk. This I know: the Arab, traveling at sea, can rest his hopes upon the space ordinarily occupied by a lifeboat, and his capacity for tolerating hardships seems unlimited.

Seasick Passengers Pray, Rush to Rail

We were bound now for Africa. To my surprise, we reached the continental coast within three days. For only one day did we lose sight of land. The Arab mariner likes to keep the shore in sight as much as possible.

Though the weather was reasonably decent, a few passengers became seasick. Their precautions and remedies were weird. Some stuffed paper in ears and nostrils; others sniffed lemons. Nearly all prayed. All was in vain: there was many a rush to the rail.

Some of our passengers, decent citizens, cooked, ate, and slept without raising a rind, [illegible] the ship became a bedlam.

We had several blind men going to Zanzibar to beg, and there was a surprising number of wild, mischievous children. No one seemed to be looking after the boys, until some of them fell overboard. Luckily, they were good swimmers.

Although I counted our passengers every day, I was seldom sure how many we had, because whenever we came into a port some of them slipped over the side. The nakhoda, of course, had a list, but when he called off the names he was never certain who was answering "Here!"

Authorities at Mogadishu, our first large port of call in East Africa, took a dim view of our human cargo. They laid down the law: any immigrant not previously resident in Somaliland must go elsewhere.

From the Bedouins, their provisions exhausted, arose a wail of anguish.

But on they had to go, for the days when Arab mariners hugged the East African coast, opening sea routes and founding ports, are gone.

In any port nowadays the best visitors are white-uniformed immigration inspectors to control the ancient movements of peoples, doctors to shut out smallpox, and police to see that the independent Arab pays at least lip service to European laws.

Bayan Does 280 Miles in a Day

Our passengers suffered their disappointment secure in the knowledge that Allah would take care of them. We had to go to Mombasa, in Kenya, before we finally got rid of them.

In Mombasa, a nominal dominion of the Sultan of Zanzibar, the Arab has the last of his privileges. Even our blind beggars were allowed to land. They paid their fare—$2.50 for a 1,800-mile voyage.

Ali and Hamed heaved sighs of relief on getting rid of the Bedouins who, they admitted, were truly well-behaved compared with others they had known.

Our voyage to Mombasa was made with a steady wind always in our favor. We caught plenty of fresh fish for the pot. *Bayan* sailed so well that one day, with a fresh monsoon and south going stream, she made no less than 280 miles—very good time indeed.

More than once the nakhoda proved his seamanship. I admired the way he piloted his ship into Mogadishu by night and into Lamu on a falling tide. Hamed the mate was every bit as good.

As to navigation, Ali said, all he had to do was to run down with Africa on his right and then back again with Africa on his left. As for the ports, he knew them by their landmarks.

His morning knowledge descended from a line of seafaring ancestors going back, no doubt, to the Phoenicians. Ali scoffed at my book learning.

A day and a night out of Mombasa we put into Zanzibar, the Arab headquarters. Here the nakhoda sold the cargo, distributed a few East African shillings to the sailors, and moved ashore.

While we stayed at anchorage for two weeks, the crew bought lemons and made sherbet to their hearts' content. They raised Cain in the Bazaar.

Mud, Mangroves, and Mosquitoes

With visions of romantic places, I hoped that our skipper would find a cargo for the Comoro Islands (Archipel des Comores) or Madagascar. He undertook, instead, a venture to the delta of the Rufiji River to load mangrove poles for sale in Arabia.

Should any wanderer ask you, "Do you want to go to the Rufiji Delta," tell him

"No!" I speak from experience, for I spent a month among its mangroves, mud, monkeys, and malarial mosquitoes. Every insect bite was a stab with a red-hot needle; every scratch festered.

In the Rufiji, flowing out of Tanganyika, the German raider *Kaiserberg* met her doom in 1915, and we anchored little more than a mile from her broken hull rusting in the mud.

Waters of the many-mouthed Rufiji were three parts water and one part mud. Its swamps were three parts mud and one part water. It rained every day. Croc miles and hippopotamuses sported by.

The crew worked dreadfully hard cutting poles, and all hands turned down.

When we sailed, with full cargo, the tired and emaciated sailors thanked Allah.

Back in Zanzibar early in April, we waited for the southwest monsoon so that we could run back to Arabia with a fair wind. That is the way of all these voyages: they sail south on the northeast monsoon, which fortunately follows the ripening of the Iraq dates, and homeward on the southwest, always a fair wind, up and down, one voyage a year.

We found 50 big dhows like ours in Zanzibar, waiting for the breeze.

A Cargo of Maria Theresas

Here we loaded groundnuts, canned coconut oil, and an odd lot of vermicelli, all of which Ali hoped to sell at a profit in the Muscat bazaar.

We also took on board a few sacks of Maria Theresa thalers, dated 1780, year of the Queen's death, but coined by the Royal Mint in London the previous year, when there was a big demand for them. These heavy silver coins, so prized by the Arabs, we bought at a discount, confident we could sell them at a premium in Muscat.

In addition, we took aboard three Swahili schoolteachers who wanted to see the world. Sailing by night (for the channel was tiny), we ran up the coast bound for Muscat on the Gulf of Oman.

The voyage took 24 pleasant days. During this time we spoke many other Arab vessels, from Kuwait and the Hadhramaut and Oman, and saw *boggalas* homeward-bound to Bombay and beams from Iran. The combined fleet must have been one hundred strong.

Many vessels traveled in companies because, I was told, of their ancient fear of pirates. At evening they made a beautiful sight sailing together into the setting sun.

So we came to Muscat, but delayed little, for business was dull in that ancient town. Hearing that it was better up the Persian Gulf, we hurried toward Bahrein Island, home of pearls and petroleum.*

Saudi King Buys Our Lumber

Immediately on arrival we sold our full cargo of mangrove poles to agents of Ibn Saud, King of neighboring Saudi Arabia, for use in the building boom brought on by the oil strikes in the Nejd. The price was good; the Saudi King is no haggler.

Cargo discharged, *Bayan* hurried to Kuwait, her home port, 275 miles from Bahrein. She arrived in June, ten months and 10,000 miles after her departure. The ship was tipped down, beached, and propped up with stilts to rest until a new crop of dates ripened beside the Tigris and Euphrates.

And now I said good-bye to my Arab friends of the last seven months—to Ali; Hamed his mate; Mohammed the boatswain, who sang and danced; old Yusuf Shirazi, the steward and storekeeper; Kaleel the carpenter; Jassim the cook; and the others. The round voyage meant 10 months' hard work to them, for which the average man's share amounted to $80.

Their money did not last long. They hardly had time to greet their families before some of them were out prowling the Gulf in pearling ships, trying to ease out a living before *Bayan's* next voyage.

For their small wage they toiled in 20 pearls slaved in Rufiji mud, and broiled in Aden. Their sustenance was a mess of rice with such fish as they could catch, and perhaps a bite of meat. Their pleasures were a puff upon the water pipe (page 681), an occasional run ashore. Their beds were teak planks and their covering was the stars (page 686). In their own way they were as good seamen as I have known, and better than most.

A Last, Nostalgic Look at Arab Sails

Not long ago I chanced to be in Aden again. At the Ma'alla anchorage stood several Kuwait boums, laden with Basra dates. Going aboard one, I was entertained with music and song. When my own motor-powered craft took me on, I looked back on the big sailing ships with admiration and, indeed, with some envy for their crews.

Though I suffered injury, hunger, dysentery, and malaria during my year in dhows, I would not trade the experience for a berth in the *Queen Elizabeth*.

* See, in the NATIONAL GEOGRAPHIC MAGAZINE, "Bahrein, Pearl of Pearls and Petroleum," by Maynard Owen Williams, February, 1946; and "In Search of Arabia's Pearl," by Peter Bruce Cornwall, April, 1948.

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The Society's [illegible] have pushed back the historic horizons of the northwestern United States [illegible] permit security [illegible] Colombia showed the Air [illegible] by taking the image of the most [illegible] dwellings in that region. The Society's re[illegible] which [illegible] historic [illegible] for more hundred years.

[illegible] The Society and the Smithsonian Institution [illegible] discovered the oldest work of man in the [illegible] for which we have a [illegible] Sandia Mountains [illegible] Sandia Man [illegible] Society [illegible] dated in America and [illegible] of early American culture [illegible].

The Society [illegible] in a flight sponsored jointly by the National Geographic Society and the U. S. Army Air Corps, the world's largest balloon, *Explorer II*, ascended to the world's altitude record of 72,395 feet. Capt. Albert W. Stevens and Capt. Orvil A. Anderson took about [illegible] the greatest [illegible] measurements and obtained results of extraordinary value.

The National Geographic [illegible] U. S. Army Air Forces Expedition [illegible] a camp in southern Brazil, [illegible] and observed the solar eclipse of 1947. This [illegible] expedition of the Society to observe a total eclipse [illegible].

The Society cooperated with Dr. William Beebe in deep-sea explorations off Bermuda, during which a world record depth of 3,028 feet was attained.

The Society granted $25,000, and in addition $25,000 was given by individual members, to the Government when the [illegible] purchase for the purpose was insufficient, and the [illegible] of the Giant Forest of Sequoia National Park, California were thereby saved for the American people.

One of the world's largest [illegible] and glacial systems outside the polar regions was discovered in Alaska and Yukon by [illegible] Wood Idyll, who [illegible] for The Society and the Harvard Society [illegible] Expedition [illegible].

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[illegible]

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[illegible]

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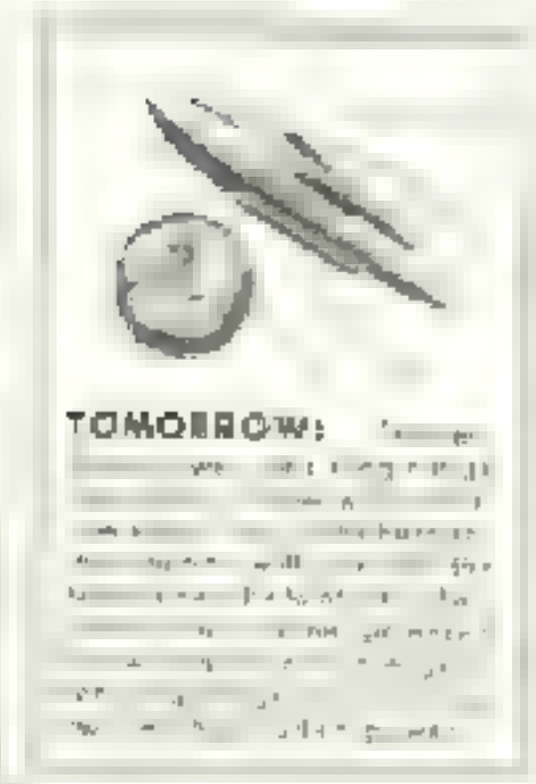

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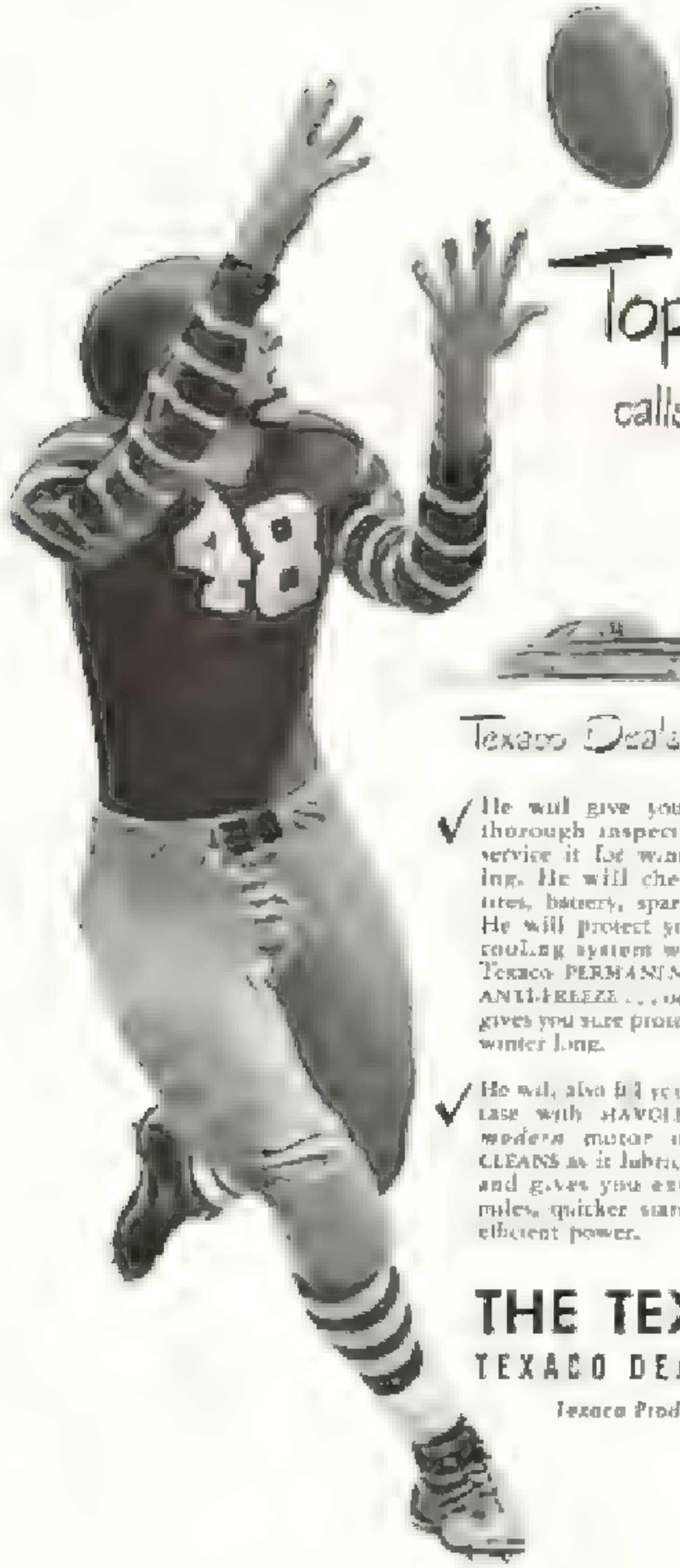

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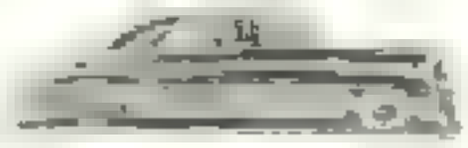

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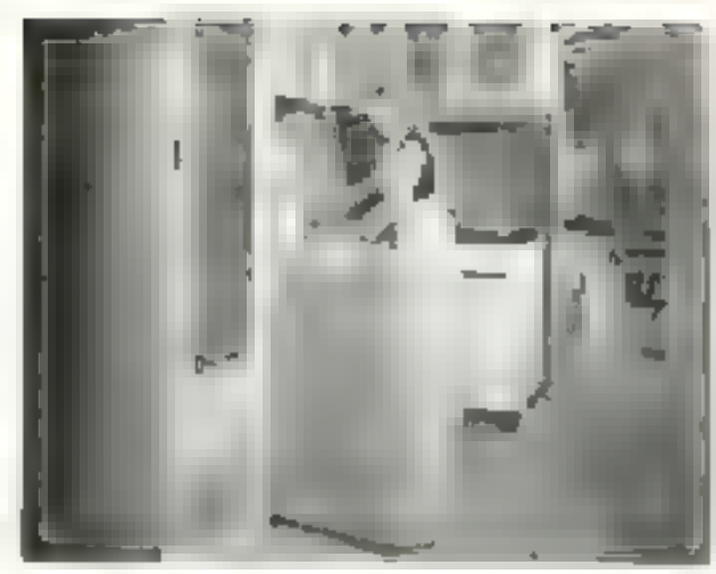

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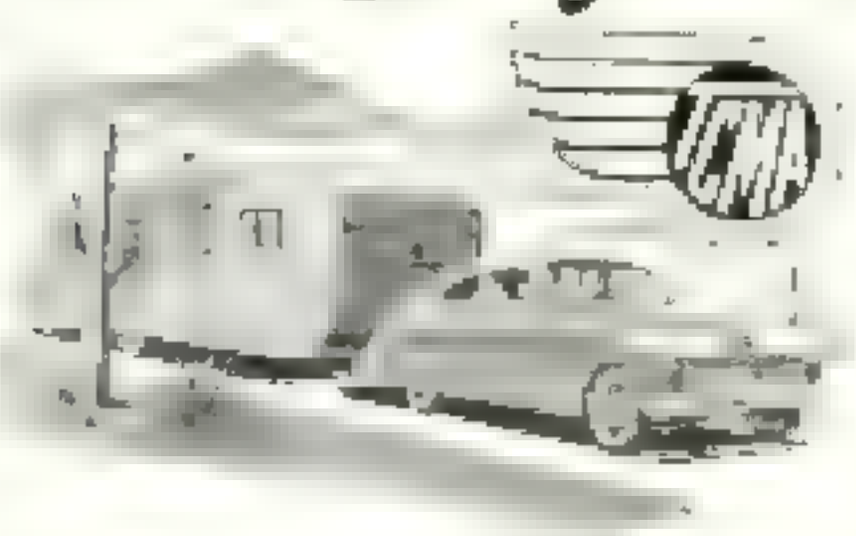

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● For wonderful living freedom, marvelous home [illegible] GREATER [illegible] you must lead trailer coach life. In a trailer coach bearing the winged wheel emblem of T.C.M.A., built to standards based on the knowledge and experience of the nation's leading manufacturers, you get today's greatest value in year 'round living and travel accommodations.

[illegible] the smart v-styled furnished living rooms, the ultra-modern [illegible] the [illegible] wardrobes. Toilet and shower are optional. Efficient heating and insulation, in T.C.M.A. approved coaches, assure your comfort regardless of season or [illegible]

WRITE TODAY for 72-page profusely illustrated book with specifications and details of America's finest coaches. Address Department 1119, Trailer Coach Manufacturers Association, Civic Opera Building, Chicago 6, Illinois.

Write LEARN HOW YOU CAN OWN A PROFITABLE TRAILER PARK

[illegible] Parks, Department 1119, T.C.M.A., [illegible] ing, Chicago 6, Illinois.

You'll Remember Oregon!

ENJOY A VACATION [illegible]

Oregon

[illegible]

See America First Class

To see America first class, here is the important thing to remember:

Pick out the trains with a General Motors Diesel locomotive up ahead.

Then, regardless of the railroad you buy, you'll travel everywhere first class. [illegible] General Motors locomotives give a smoother ride. Trains start and stop without annoying jolts or jerks.

You'll make your time count, too. In spite of [illegible] "on-time" [illegible] And you'll see more because no smoke or steam will mar your view.

That's why General Motors locomotives are heading 197 of the nation's finest name trains.

As a [illegible] "Better trains follow General Motors locomotives."

ELECTRO-MOTIVE DIVISION

GENERAL MOTORS • LA GRANGE, ILL.

Home of the Diesel Locomotive

Presenting a major achievement in music . . . the record that plays up to 45 minutes . . .

COLUMBIA

Lp

LONG PLAYING MICROGROOVE RECORD

the sensational new

...finer tone quality

...more music for your money

...saves storage space

...nonbreakable Vinylite

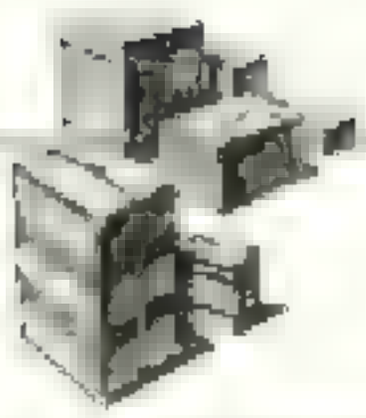
"[illegible]"

"[illegible]"

"[illegible]"

FREE DEMONSTRATION! [illegible]

Suppose America depended on <u>this</u> kind of "common carrier"



[illegible]

[illegible]

But actually, of course, the railroads provide and work with [illegible] and the tracks [illegible] they run. The [illegible] freight one mile is only 1½¢.

[illegible]

[illegible]

[illegible] Only in this way can they [illegible] to provide the lowest [illegible] fast transportation so essential to the very life and prosperity of [illegible]

*

Listen to THE RAILROADS [illegible] *presenting the world's grand [illegible]* every Monday evening over the ABC network. [illegible]

ASSOCIATION OF AMERICAN RAILROADS

[illegible]

"What's beneath their beauty is more exciting still..."

said **ANN DELAFIELD**

when told the story of the

new DuraPower Mainspring

in **ELGIN** *Watches*

Sometimes, when the new Elgin Watches are [illegible] Miss Delafield [illegible]

[illegible]

[illegible] Elgin Watches [illegible]

[illegible]

ELGIN watches

TIMED TO THE STARS!

The genius of America ★ ★ ★ for great no name to rival

[illegible] of Sieff Thomas [illegible] Newark

Look what you can have at your elbow the year round . . .

You can have [illegible] enjoy as much [illegible] when you [illegible] store them in a General Electric Home Freezer.

You can stock a variety of [illegible] delicious fresh frozen foods [illegible] quantity when you [illegible] time. You can freeze [illegible], asparagus, apricots, grapes—even [illegible]

You can have [illegible] year round. You can have an [illegible] have the most [illegible] and [illegible] etc. You pay less for food [illegible] when you own a General Electric Home Freezer.

. . . when you own a dependable General Electric Home Freezer!

[illegible] food. Also available in [illegible] cu. ft.

When you go to buy a Home Freezer, be sure you're getting the best [illegible]

A freezer is a long-term investment, and you've every right to expect dependable service year after year.

General Electric Home Freezers have the same type of [illegible] refrigerating system as that used in G-E Refrigerators. More than *1,500,000 of these [illegible] refrigerating systems [illegible] G-E Refrigerators for 10 years or longer.*

See the G-E Home Freezer at your General Electric retailer's, or write for interesting booklet to General Electric Company, Bridgeport 2, Connecticut.

General Electric Home Freezers

For quick-freezing foods at home . . .

For storing the frozen foods you buy

GENERAL ELECTRIC

The high cost of living is shooting us all sky high!

When living costs rise like a rocket, that's every bit as hard for business as it is for customers. Fewer people buy when prices are too high.

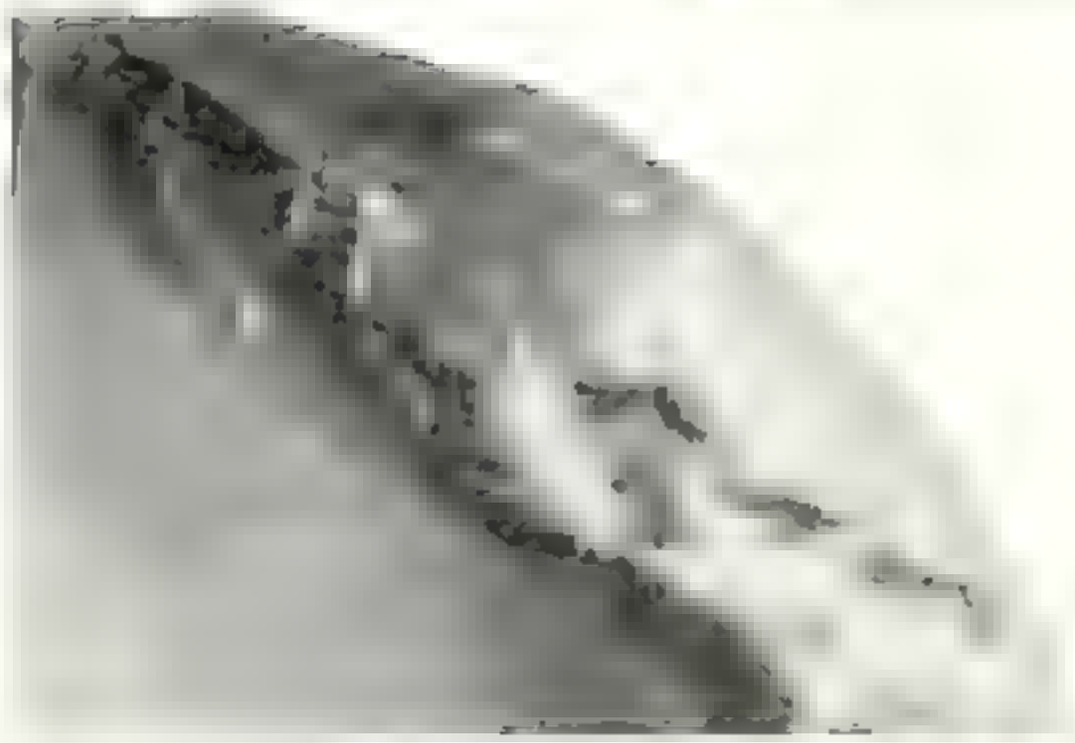
In our own business we do everything we can to keep prices down and quality up. Once every month [illegible] men from our companies at dinner to plan new ways to [illegible] economy and improve products—so you will get *top quality at lowest possible price.*

Here are some figures which show how milk prices compare with food prices, from 1939 to 1948:

Increase in cost of food 118%
Increase in cost of fluid milk . 78%

Notice that milk has not increased nearly so much as the average of other foods. Our profit from all of our milk divisions averaged less than ½ cent per quart sold in 1947—far less than the public thinks business makes—and much less than the average profit in the food industry.

Milk nature's most nearly perfect food—helps your budget by giving you more for your money than anything else you can eat. We guard the quality, flavor and nutritional values of milk, and cheese, butter, ice cream and other products made from milk. *Then we make them available to the largest number of people at the lowest possible prices.*



An impartial national survey shows that most Americans consider 10% [illegible] 15% [illegible] a fair profit for business. Compared to this, the average profit for the food industry is less than 5%. And National Dairy's profit on its [illegible] sales in 1947 was less than 2%.

NATIONAL DAIRY
PRODUCTS CORPORATION

Standard Package

200 NOTE SHEETS
100 ENVELOPES
Printed with your name and address

$1.00

[illegible] has been [illegible] for [illegible] years. It [illegible] white [illegible] bond paper to [illegible] with [illegible] name and address on [illegible]. It's a perfect gift — [illegible], personal, useful.

Just [illegible] and address you want printed, maximum [illegible] lines, 30 characters per line, [illegible] will be [illegible] to you. Please order [illegible]. No [illegible] order [illegible]. Rest of order for West of Denver, Colo., and [illegible] add 10% to prices. We [illegible] Satisfaction guarantee.

Envelopes Only

[illegible] envelopes only [illegible] Standard Package [illegible]

$1.00

Deluxe Package

[illegible] envelopes [illegible] $2.00

THE AMERICAN STATIONERY COMPANY
[illegible] AVENUE [illegible] INDIANA

AMERICAN STATIONERY

The Finest Stationery in the Hoosier Fair

ELECTRONIC WONDER!

Amazing New Dictaphone TIME-MASTER records on plastic belt!

[illegible] TIME-MASTER is the [illegible] machine that ever [illegible] Better or [illegible] Dictaphone.

And you can [illegible] TIME-MASTER [illegible] any business [illegible] or the TIME-MASTER [illegible] Mail [illegible] belt—just [illegible]

Twelve plastic belts—[illegible]

DICTAPHONE

Electronic Dictation

[illegible]

[illegible] Dictaphone [illegible] Every way for you an hour [illegible] can match the TIME-MASTER [illegible] Dictaphone [illegible]

FOR A DEMONSTRATION [illegible] TIME-MASTER [illegible]

[illegible] Lexington Ave., N. Y. C.

☐ [illegible] show me the new [illegible]

☐ [illegible] TIME-MASTER [illegible]

Your Name

Company

Street Address

City & Zone State

ADMIRAL
Triple Thrill

FM-AM RADIO

3-SPEED PHONOGRAPH

MAGIC MIRROR TELEVISION

Complete

HOME ENTERTAINMENT

ALL IN *One*

LUXURIOUS CONSOLE

$499.95

Your Admiral [illegible] comes this triple thrill [illegible] complete home entertainment. **MAGIC MIRROR TELEVISION** [illegible] TV [illegible] the clearest picture [illegible] Super powerful [illegible] 23 tubes [illegible] dependable performance [illegible] Complete channel coverage. Here, too, is a powerful **FM-AM RADIO** including the latest features in static-free FM as engineered by Admiral. New **3-SPEED AUTOMATIC PHONOGRAPH** plays standard as well as the necessary new LP (long play) "microgroove" records. Imagine [illegible] a standard record album [illegible] from a single 10" record. Truly a triple-thrill [illegible] in a breathtaking [illegible] cabinet only 48 inches wide! See it! Hear it! Today

AMERICA'S SMART SET *Admiral*

burned

to a crisp—but no loss to the owner!

These are the ashes of National City Bank Travelers Checks destroyed in a fire. The owner received a prompt refund in full.

It's a great reassurance to know that when you carry NCB Travelers Checks your funds are completely safe from loss or theft.

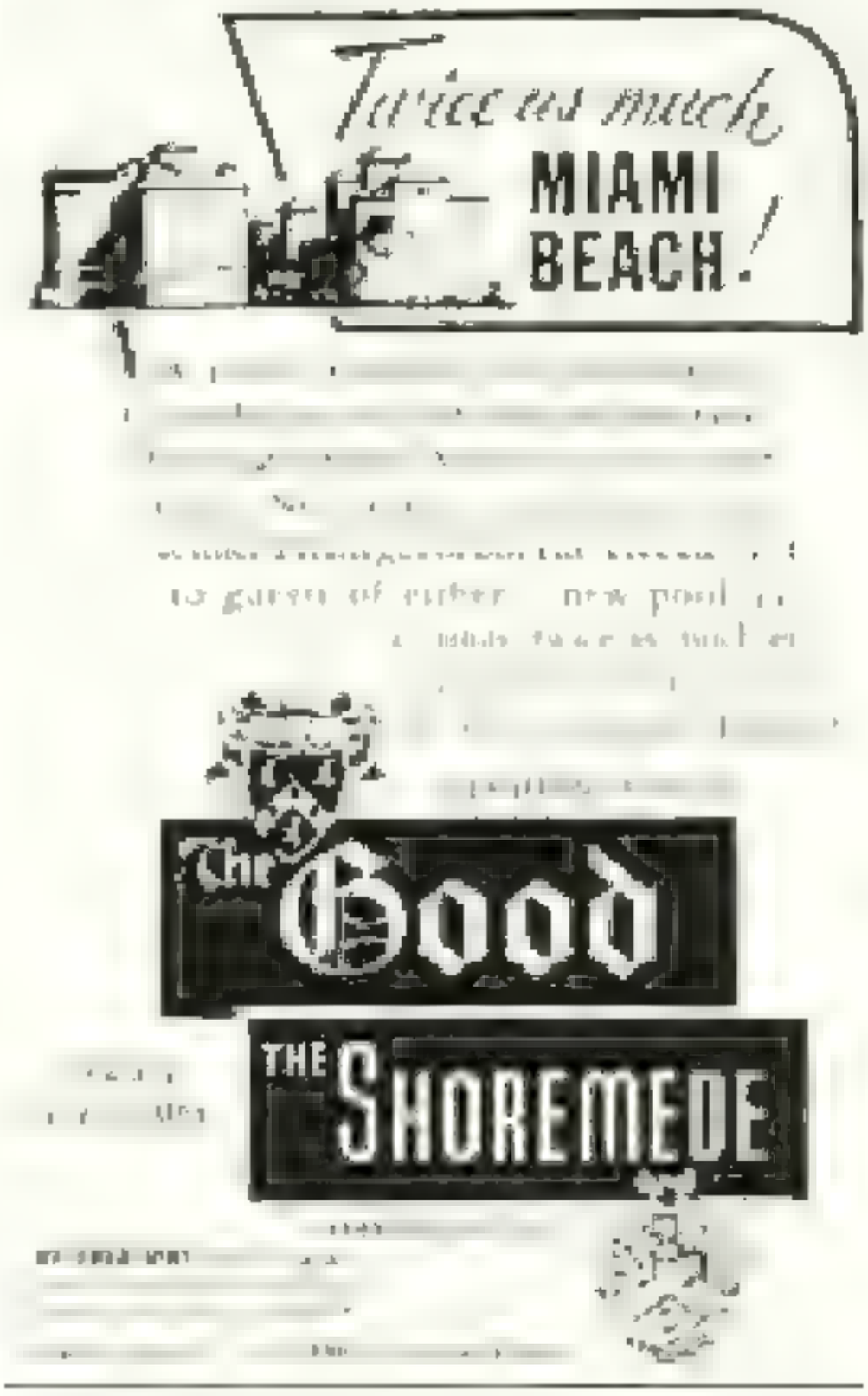
They're as readily spendable as cash everywhere. Hotels, shops, railroads and steamship lines know that NCB Travelers Checks, backed by The National City Bank of New York, protect them just as they do you.

You sign NCB Travelers Checks once* when you buy them—and a second time* when you spend them. They are good as used. Cost only 75¢ per $100 in denominations of $10, $20, $50 and $100.

Ask for them at your bank.

NATIONAL CITY BANK TRAVELERS CHECKS

ISSUED BY
THE NATIONAL CITY BANK
OF NEW YORK



WHAT DO YOU KNOW ABOUT FLORIDA?

Here is a little quiz about Florida. Just for fun, see how many you can answer correctly. Count 10 for each correct one. A score of 40 indicates you know your Florida, but 60 or 70 is excellent. You'll find the answers at the bottom of this page.

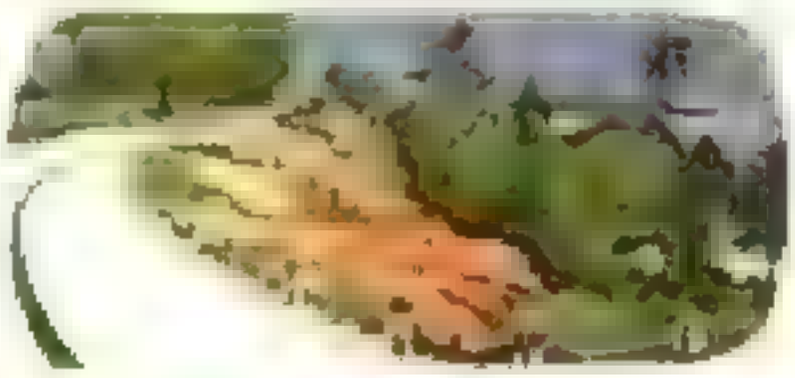
1. **SWIMMING** [illegible]

2. **HOME** [illegible]

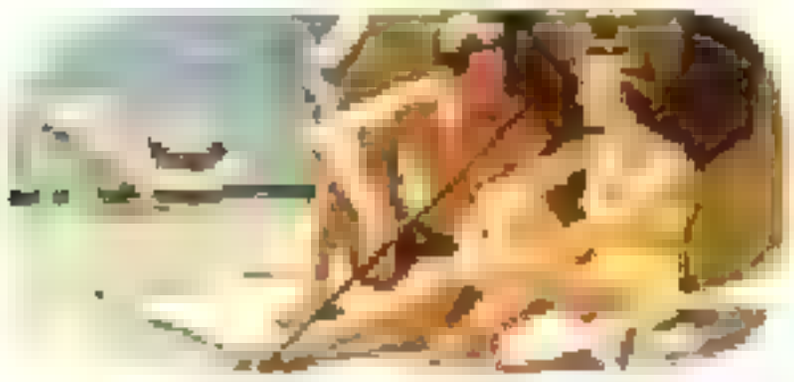
3. **FISHING** [illegible]

4. **VEGETABLES** How many freight cars [illegible]

5. **INDIANS** [illegible]



6. **HIGHWAY** [illegible]



7. **BEACH** [illegible]

8. **INDUSTRY** [illegible]

Of course, the best way to really know Florida is to come down for a vacation this winter. Get the feel of Florida sunshine. Stretch out on the warm sands. Real Relax! Catch a sailfish or a big bass...Swim in the Florida water you ever saw. Play golf. Enjoy thrilling spectator sports. Dance under a tropical moon. Visit famous gardens, springs, unusual attractions and historic landmarks. See ALL of Florida!

You can make your Florida holiday as lavish or as economical as you like. Florida offers its recreation and accommodations in all price ranges.

LOOK TWICE AT FLORIDA

A winter vacation in Florida is just a sunshiny sample of the real Florida. Climate-wise and otherwise—industry will find many plus factors for profitable operation. Acres of opportunities await experienced farmers. And Florida is the stimulating answer for those who seek a new, happier way of life.

Pick your favorite...

they're all good if they're

EARLY AMERICAN

Old Spice

FOR MEN

mug

10-12 Months' Supply . . . 1.00

Trepik .65

stick

Big, Clean and Economical .75

lather

Quick-Forming, Non-Drying .60

brushless

Richer, Creamier, Smoother 60

. . . and for that wonderful "good morning" feeling it's Old Spice After Shave Lotion 4½ oz. 1.00 9½ oz. 1.75 plus tax

SHULTON

Rockefeller Center, New York

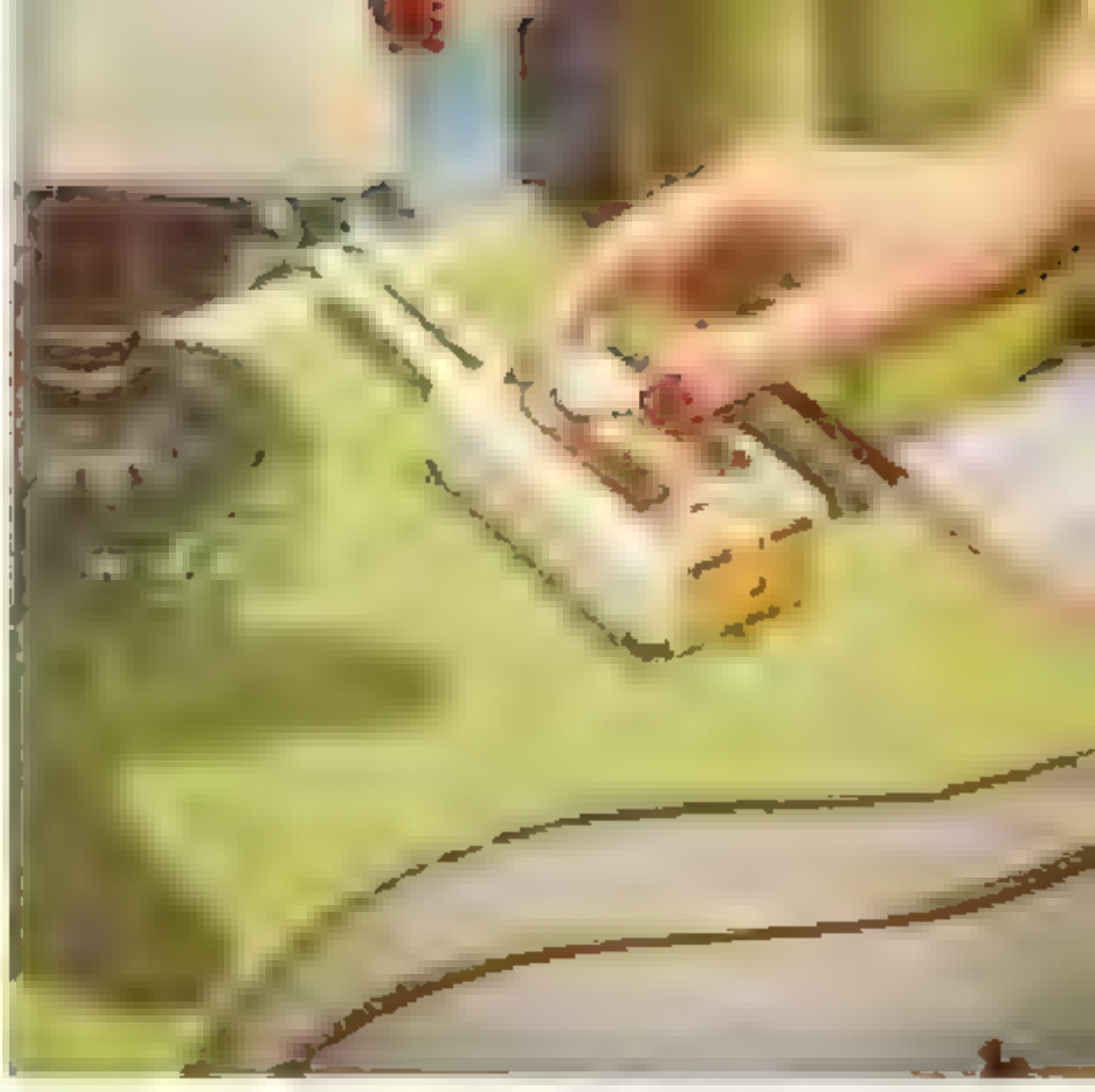
Bienvenue à QUÉBEC

Plan now a wonderful different winter vacation in la Province de Québec . . . easily accessible by rail, road or plane. Keen, clear mountain skies, brilliant snow and old-time French Canadian hospitality await you in comfortable modern inns and hotels.

LA PROVINCE DE

Québec

1. Husbands and wives vote for General Electric Automatic Blanket [illegible] control. [illegible] half of [illegible]—work at degree levels. Husbands [illegible] "temperature" he likes best. Wife [illegible] warmer here.



2. Almost unbelievable—the way this small, compact Electric Control automatically keeps [illegible] temperature right [illegible]. Patents [illegible] Electric [illegible] off on [illegible] Normal average operations [illegible] less than 2¢ a night.)

Enthusiastically okayed by more than half a million users! General Electric's

AUTOMATIC SLEEPING COMFORT

General Electric Automatic Blanket does away with mountains of covers —lets you sleep, undisturbed— through all normal changes in room temperature!

3. "Washes beautifully!" [illegible] Automatic Blankets are [illegible] Washing Machines. Underwriters' Laboratories, [illegible] G.E. Blanket takes the place of [illegible] or heavy blankets. Lightweight [illegible] cases bedclothes [illegible].

4. Three Models! [illegible] Blankets for [illegible] bed sizes [illegible] and [illegible] [illegible] product's General Electric Company, Bridgeport 2, Conn.

GENERAL ELECTRIC

World Premiere!

20th Century Limited

First of New York Central's New Dreamliner Fleet

Lookout Lounge—

— from its streamlined Diesel to its raised "Lookout Lounge". . .

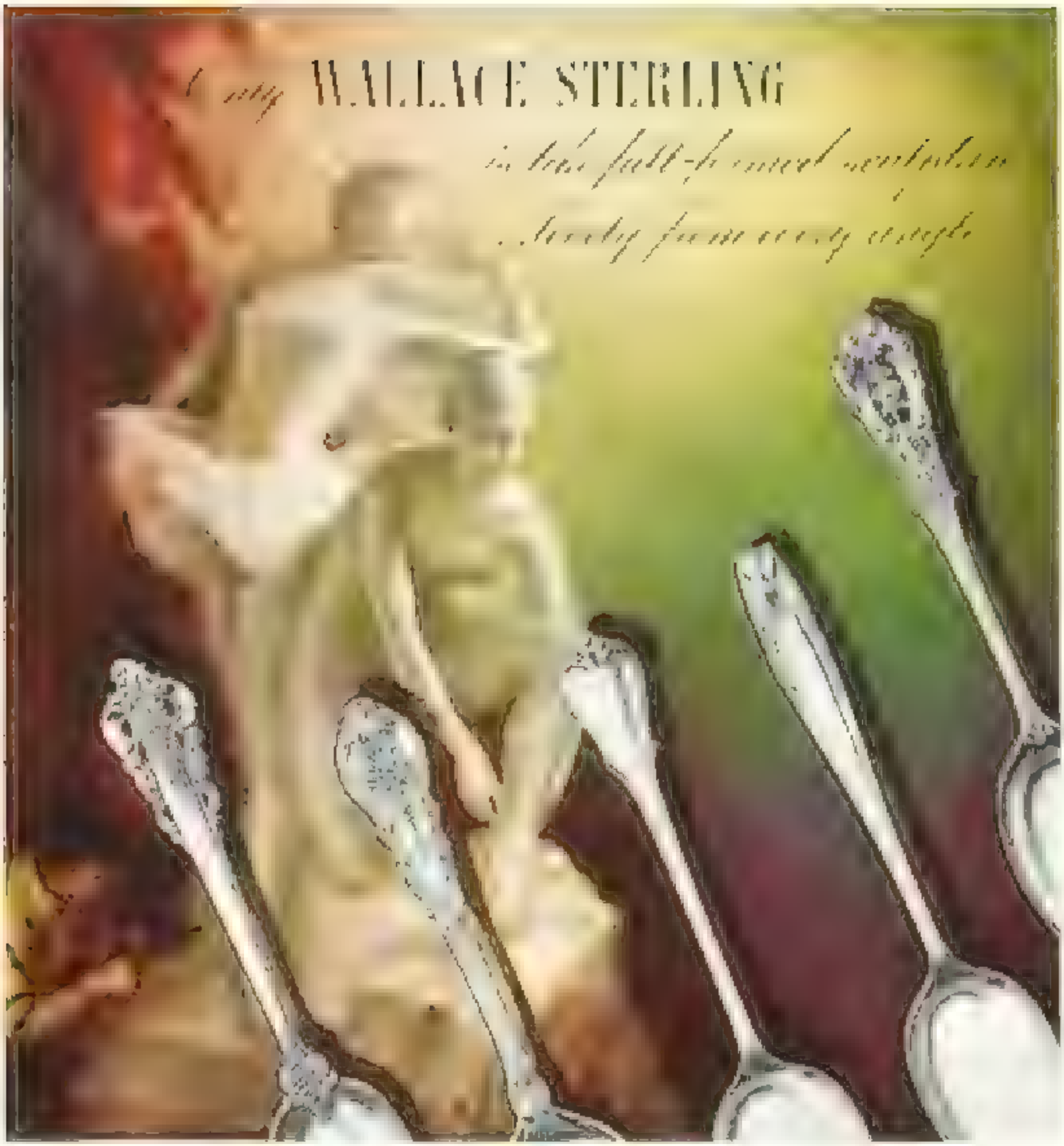
King-Size Bed—

1948 Century Rooms—

NEW YORK CENTRAL

The Water Level Route · You Can Sleep

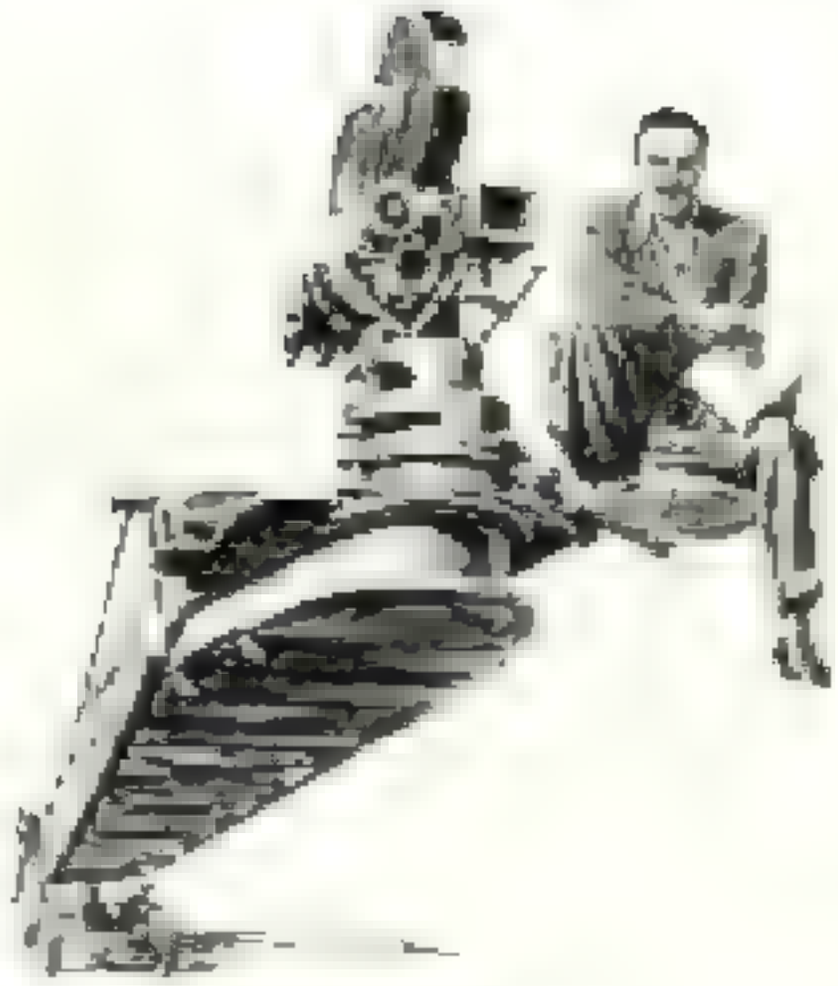
BETWEEN THE HEART OF CHICAGO
AND THE HEART OF NEW YORK



ONLY WALLACE STERLING . . . LIKE FINE-FORMED SCULPTURE . . . HAS

"Third Dimension - Beauty"

THANK YOU
for letting us take your picture



Today we send a new kind of [illegible] picture over to Technicolor for prints.

It's about you. So we think you ought to know a little about it in advance just in case you *didn't* read the story in Sterling North's beloved book "So Dear To My Heart."

Don't miss the condensation of this [illegible] novel in the December "Reader's Digest"

Think back for a moment . .

* * * *

You can't help but smile when you recall experiences you had while growing up.

The mischief you did. Your hilarious blunders. Your great discoveries when some brand new slice of life, like your first circus, struck your heart with almost unbearable wonderment.

And there were other moments.

Like your first heart-breaking disappointments. And your first determination not to cry. And your first "important personal business" in helpline with a great big kindly man named God.

* * * *

Tender moments. Remember? We believe you'll live them again when you see how young Jerry Kincaid and his pigtailed friend Tilly make out in those first encounters with life.

Somehow these adventures around Fulton Corners reflect the most treasured chapters of every American's upbringing.

And the honest, homespun people of their little world will bring back those few adults who . . . when you were growing up . . . [illegible] the hope in your heart, the spring in your backbone, the persistent dreaming in your eyes.

* * * *

We think, too, that you'll love this picture's music. It comes close to what folks are saying have the lilt and color of new American folk songs.

And woven into the live-action story are new cartoon characters designed to win a notable corner of your heart.

[illegible] magnificent songs like it will [illegible] a regal place in your heart.

But it's the story itself that will make you say, "It's a picture of me!"

So thank you for letting us take your picture in "So Dear To My Heart." We believe you'll find it a good likeness.

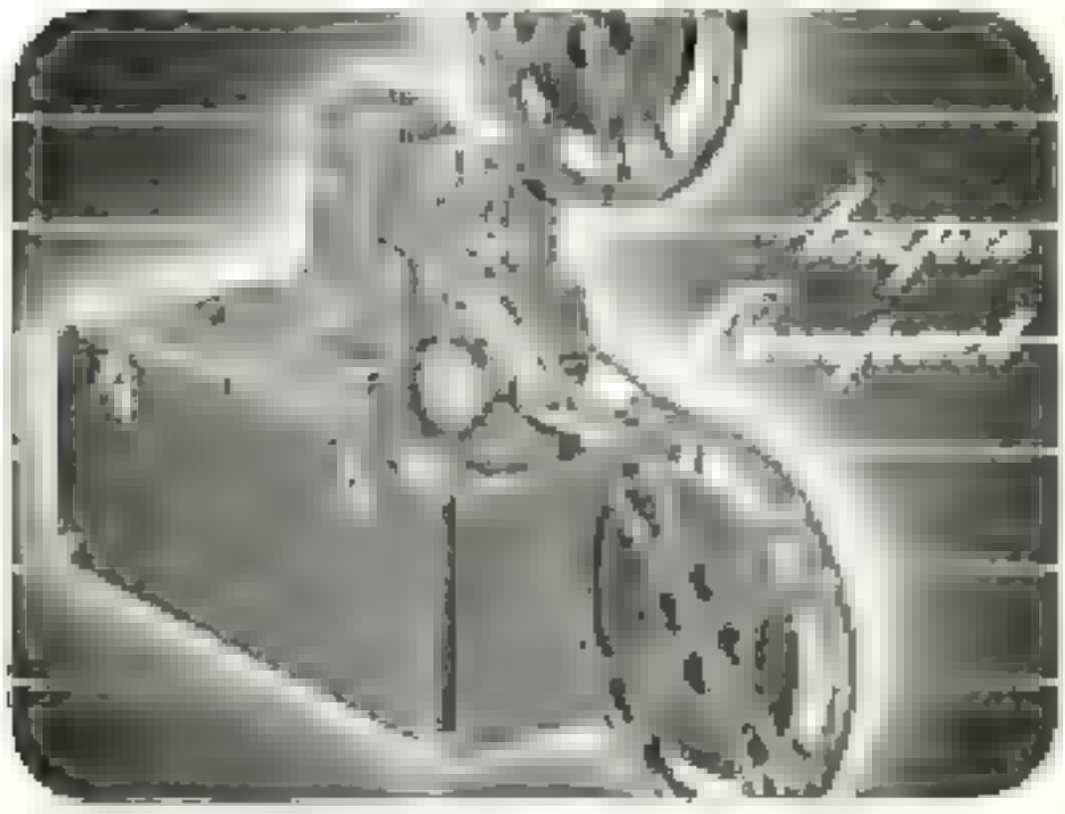
Remember your first important personal business? [illegible] kindly man [illegible]

Walt Disney

"So Dear To My Heart" is a live-action musical play starring BURL IVES, BEULAH BOND, HARRY CAREY, BOBBY DRISCOLL, LUANA PATTEN; *directed by Harold S. [illegible] through RKO Radio Pictures.* COLOR BY TECHNICOLOR.

this new kind of portable projector

for 16mm. sound motion pictures



Reeflanger 16mm. sound projector for homes, schools, churches and industry

Rapidly expanding library [illegible]

[illegible] coupon for complete [illegible]

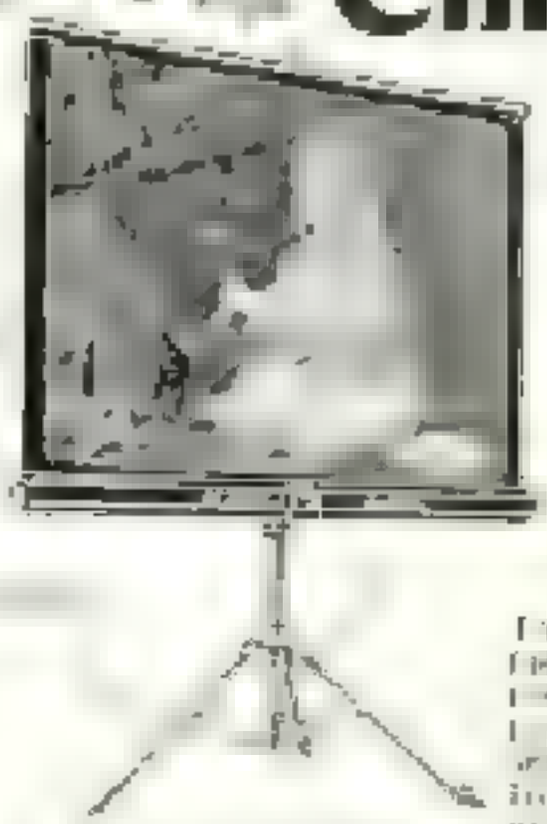
Send for Booklets

[illegible]

AMPRO

A GENERAL [illegible] CORPORATION SUBSIDIARY

This Christmas



MAKE YOUR "STARS" SHINE with a

DA-LITE

SCREEN

[illegible]

DA-LITE CHALLENGER

[illegible]

"World's Largest Selling Screen Space Image"

DA-LITE SCREEN COMPANY, INC.
2717 North Pulaski Road, Chicago 39, Illinois

SUPERB, NATURAL COLOR

KODACHROME SLIDES

A UNIQUE CHRISTMAS GIFT

[illegible]

Sets of 25 slides, each of —

[illegible]

COMPLETE CATALOG UPON REQUEST

M. E. DIEMER, Ph.D. STUDIO AND LABORATORY
[illegible] DARWALL AVE., DEPT. N, MADISON 5, WIS.

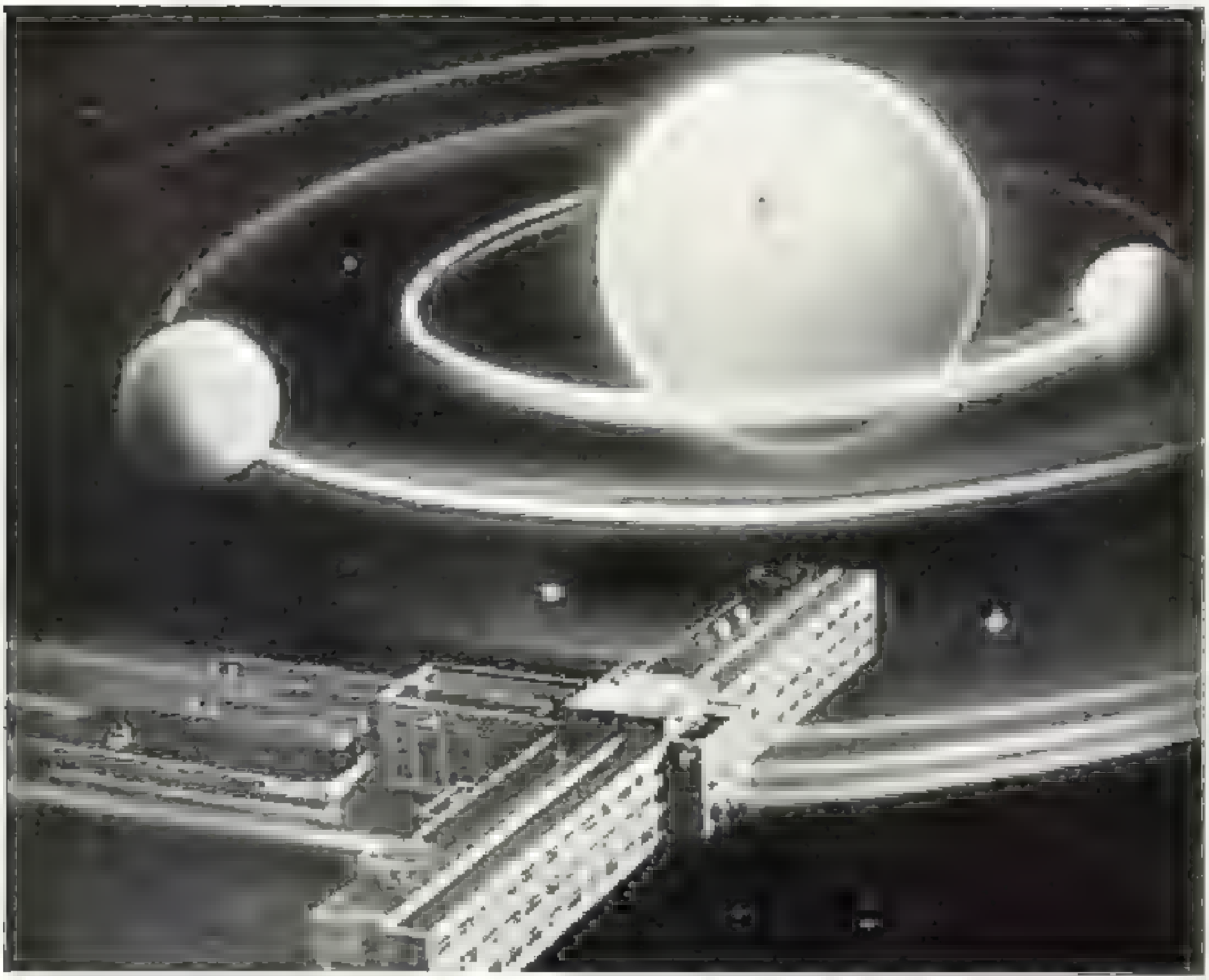
TEMPTING PRESERVES FROM OREGON MOUNTAIN MEADOWS ...FOR CHRISTMAS GIVING

No. 2 GIFT BOX [illegible] Pears with [illegible] Preserves, and [illegible]
Shipped Prepaid $2.95

WRITE FOR FREE CATALOGUE

JANE AMHERST

1120 N. E. 47th Ave., Portland 13, Ore.



[illegible] RCA [illegible]
[illegible]

93,000,000 miles of laboratory space

[illegible] storms, [illegible]

When an [illegible] Research, during which RCA scientists and engineers "worked" by instrument on the face of the sun—93,000,000 miles away—[illegible]

[illegible] has [illegible] space [illegible] was needed.

RCA scientists took a new tack. They noted that interference was most intense when [illegible] were more important than one.

[illegible] RCA [illegible]

They [illegible] which is [illegible] the [illegible] space [illegible]. As [illegible] can be [illegible] with the [illegible].

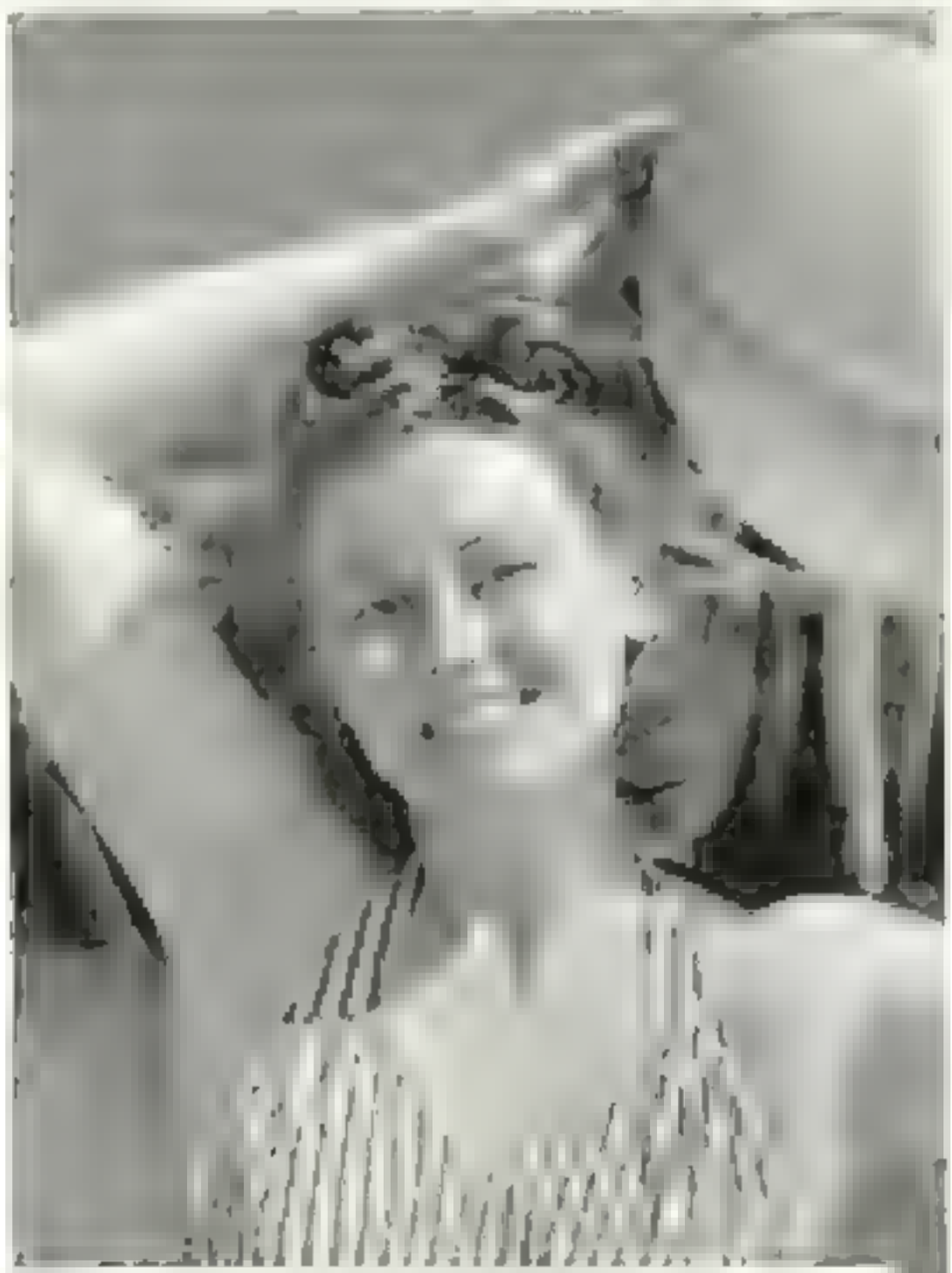
Such a pioneering spirit of research gives efficiency of service and leadership to all products and services bearing the names RCA, and RCA Victor.

* * *

[illegible] New York 20.

RADIO CORPORATION of AMERICA

DEDICATED TO THE ADVANCEMENT OF PROFESSIONAL EYE CARE



Whose eyes are better?

[illegible]

[illegible]

EXAMINATION

REFRACTION

PRESCRIPTION

INTERPRETATION

FITTING

RE-EVALUATION

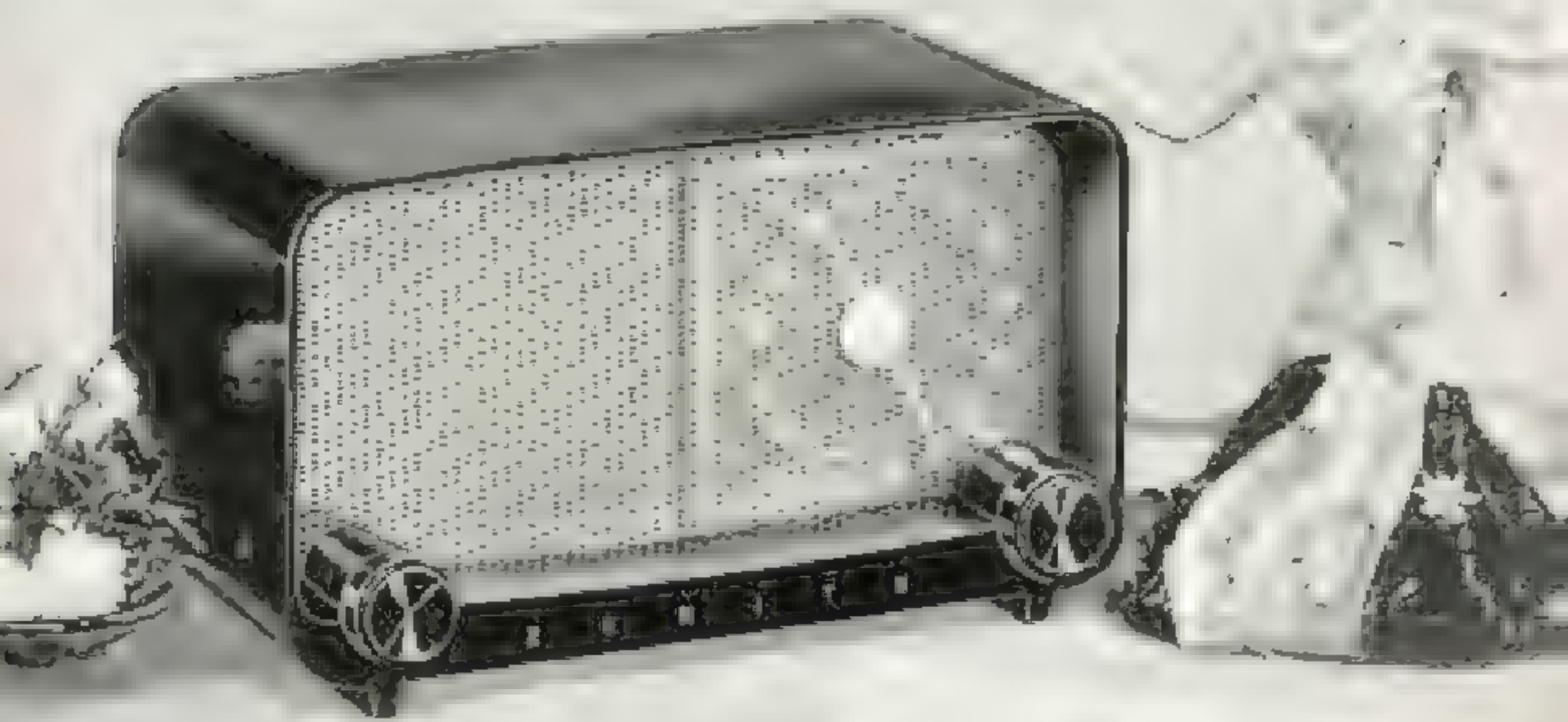
SERVICING

American Optical

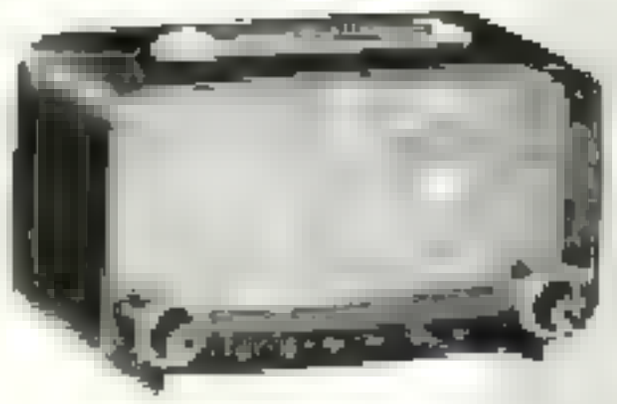
COMPANY

Founded in 1833 — the world's largest supplier to the ophthalmic professions.

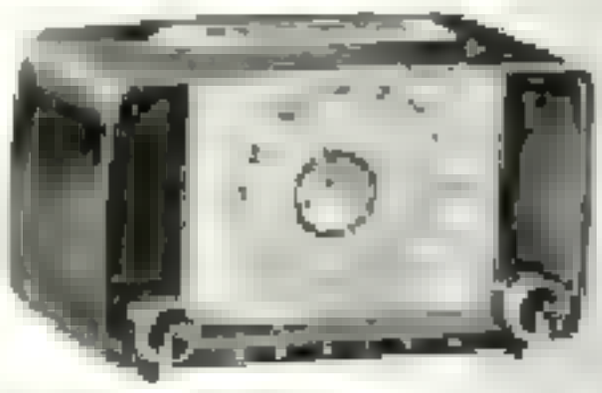
Zenith Shatters all Previous Value Standards in Table Radios!



THE NEW ZENITH "TOURNAMENT"



THE NEW ZENITH "ZEPHYR"



The New Zenith "Pacemaker"

ZENITH
LONG DISTANCE RADIO

OVER 20 YEARS OF "KNOW-HOW" IN RADIO MAKES ZENITH
ALSO MAKERS OF AMERICA'S FINEST HEARING AIDS

Do YOU Trade in these World Markets?

[illegible] Mid-Continent [illegible] Southern States [illegible] gion's extensive world trade, it is essential that your [illegible] — [illegible] — [illegible] — [illegible] *mastered the direct*, economic [illegible] way, through the ports of the United States Gulf, [illegible] *natural gateway* to all the world.

Equally important to you [illegible] pacted at your service [illegible] world trade [illegible] markets. [illegible] financial [illegible] and [illegible] transportation.

[illegible] you will find many practical and [illegible] GULF PORTS and LYKES LINES.

[illegible] Lykes Bros. Steamship Co., Inc., [illegible] New Orleans, La. [illegible]

LIMITED PASSENGER ACCOMMODATIONS

LYKES LINES

Lykes Bros. Steamship Co., Inc.

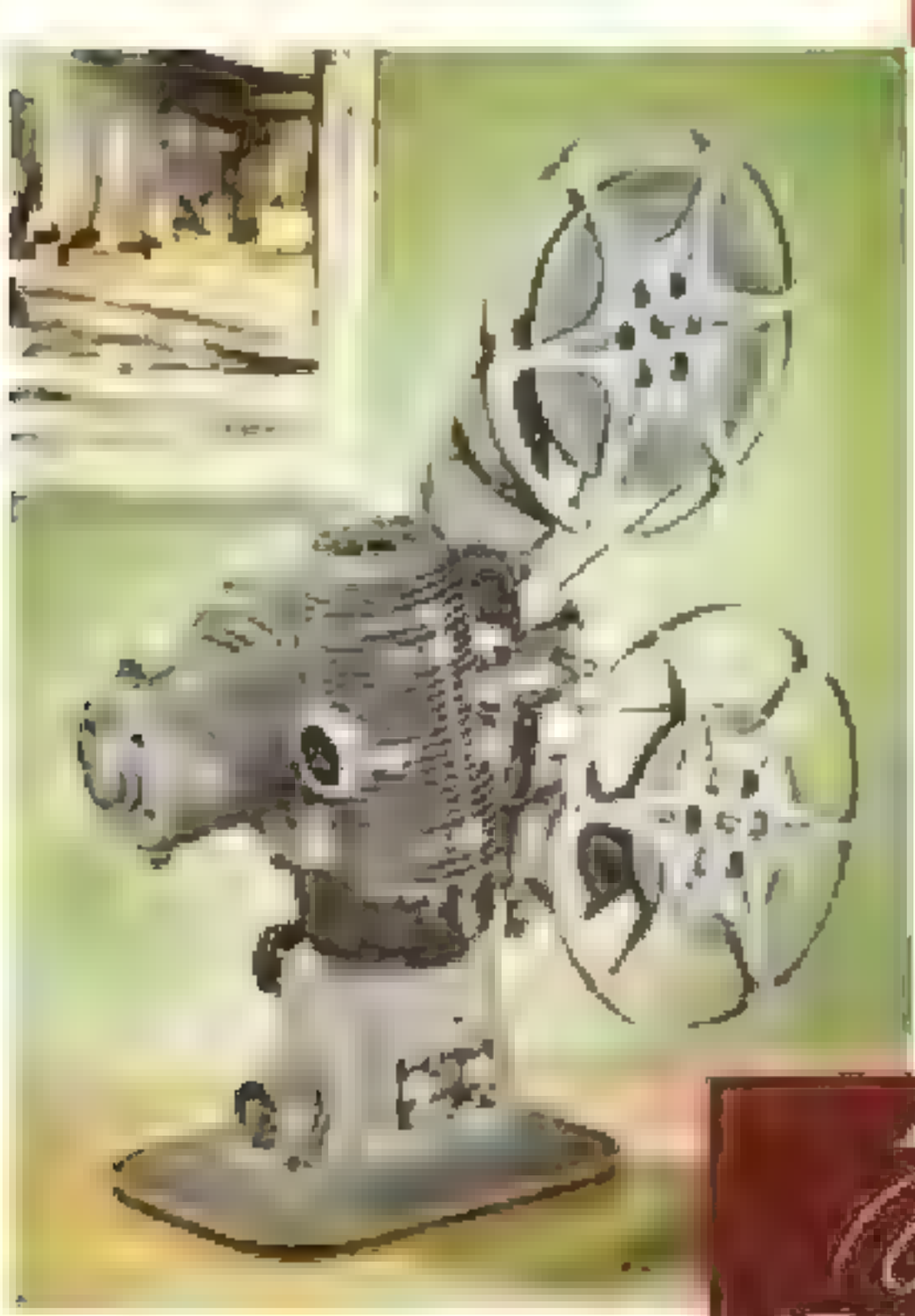
Offices at NEW ORLEANS HOUSTON, TEXAS NEW YORK Baltimore [illegible] Chicago, [illegible] Galveston, [illegible] Lake Charles Memphis, Milwaukee, Mobile, Port Arthur, [illegible] Washington, D. C. • OFFICES AND AGENTS IN PRINCIPAL PORTS

FILMOS GIVE

THE HOLLYWOOD TOUCH

TO YOUR PERSONAL

Movies



Filmo Companion Camera

Filmo Master Projector takes the Hollywood

There's a complete line

PRECISION-MADE FILMOS

by

Bell & Howell

GIFT NO. 11

GIVE A BIT OF
Florida
THIS
CHRISTMAS

GIFT NO. 2

● **Gift No. 11,** [illegible] in a Miami Harbor [illegible] approx. [illegible] lbs. of [illegible] [illegible] [illegible] **period $10.00, Gift No. 35** [illegible] (rated) same as **Gift No. 11** except had [illegible] weight [illegible] **$6.50, Gift No. 2,** [illegible] [illegible] assorted fruits and [illegible] of Grapes, Tangerines, Temples, Grapefruit, Pineapple-Grapefruit Jam — **$6.00, Gift No. 1** [illegible] **$4.50.** [illegible] **Satisfaction guaranteed.** [illegible] **Send for free,** [illegible] Price List [illegible] Gift Packages. **Prices drastically reduced this year.**

Cobbs
FINEST
FLORIDA FRUITS

GIFT NO. 31, [illegible] 2½ lb. COBBS [illegible] **Price $3.50**

Christmas giving made *EASY*

ORDER NOW!

COBBS, Box C-9
Little River (Miami), Fla.

[illegible] for gift packages to be shipped [illegible] ATTACHED LIST.

Please send me your free [illegible] Illustrated Brochure Price List.

NEW APARTMENT HOMES
WITH FULL HOTEL SERVICE

[illegible]

WRITE FOR NEW BROCHURE

Tradewinds
MIAMI BEACH

BAL HARBOUR
MIAMI BEACH

Sea View

[illegible]

It's Springtime
THE YEAR 'ROUND IN
Clearwater, Florida
QUIET ☆ CLEAN ☆ SUNNY ☆
HEALTHFUL ☆ DELIGHTFUL
THIS WINTER ENJOY THE BEST
...COME TO CLEARWATER

WRITE FOR FREE FOLDER TO
PAUL FICHT, SEC'Y CHAMBER OF COMMERCE
CLEARWATER, FLORIDA

You can be sure... if it's

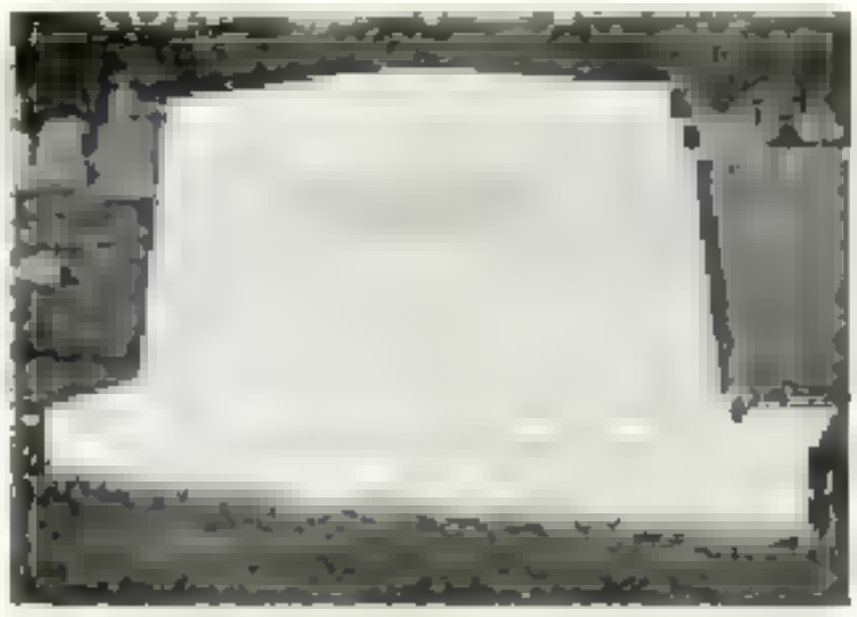
Westinghouse

There's one way to be sure of crisp engineering, authentic styling, and listening pleasure when you buy a radio — buy Westinghouse. The set shown here, for example, has extra value features usually found only in sets costing hundreds of dollars more. It has exclusive Automatic Record Changer, Electronic Feather reproducer, Radio now Tune FM, 25 watts of undistorted output, two short wave bands, plus a magnificent period cabinet of fine mahogany. Home Radio Division, Westinghouse Electric Corp., Sunbury, Pa.

Listen... and you'll buy **Westinghouse**

Listen to Ted Malone every morning Monday through Friday — ABC Network

A frank suggestion for immediate family discussion



DEAFENED?

TWO NEW ALL-IN-ONE
Western Electric Hearing Aids
OFFER BETTER HEARING FOR THOUSANDS

NEW MODEL 65

NEW SUPER 66

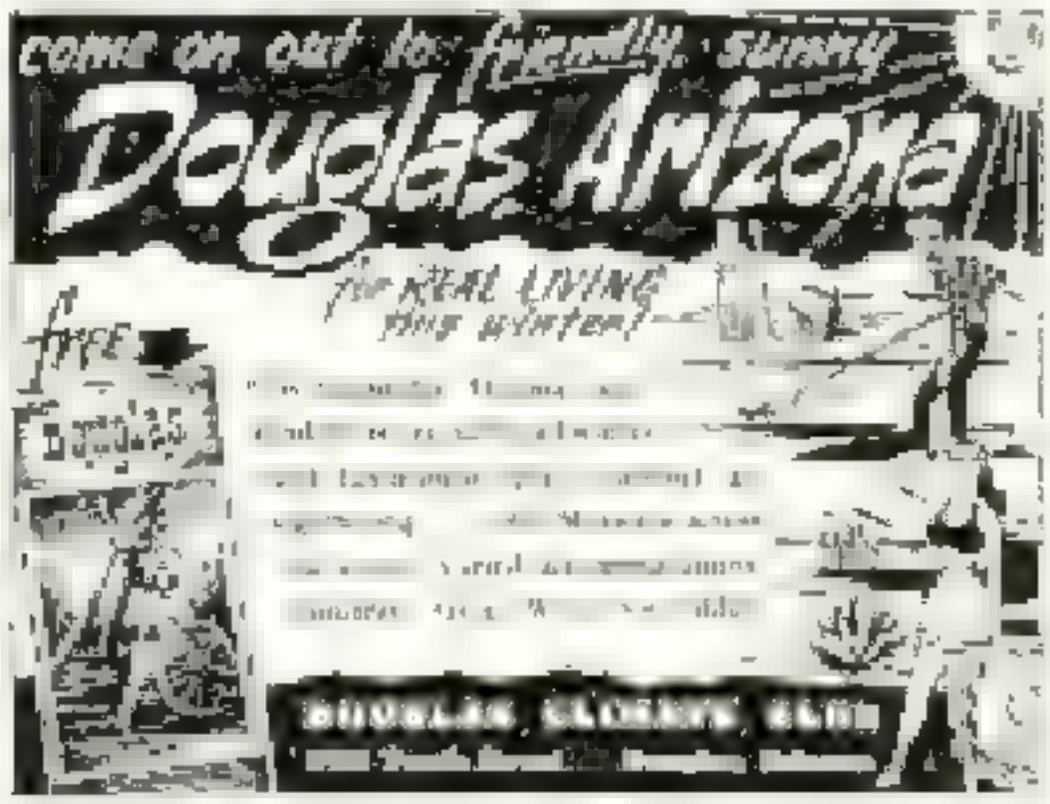
SEND TODAY FOR TWO FREE BOOKLETS

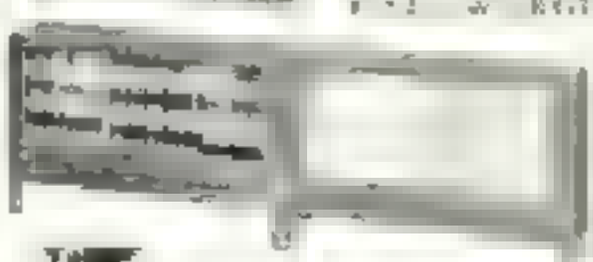
Western Electric Dept. 380-N11
195 Broadway, New York 7, N. Y.

Name _____

Address _____

City _____ Zone _____ State _____





HANDSOME WAY TO HOUSE BOOKS

Globe-Wernicke
SECTIONAL BOOKCASES

HOW TO LEAD A HAPPY, USEFUL LIFE WITH

DIABETES

Diabetes results from the body's failure to make proper use of sugars and starches. It occurs when something goes wrong with the system's natural supply of insulin.

Starting with the development of prepared insulin 27 years ago, medical science has made many advances in treating and controlling diabetes. There is now hope that the use of radioactive "tracers" in future research will contribute to a greater understanding of this disease.

1. Today, by utilizing current medical knowledge through close cooperation with the doctor, most people with diabetes may look forward to living a happy, useful life.

2. Prepared insulin is sometimes used when the diabetic does not produce enough for his needs. Now, a new [illegible] insulins make possible more accurate control of diabetes.

3. Diet determines the amount of sugar and starch taken into the body. In some cases, by balancing diet and exercise, diabetes can be controlled without added insulin.

4. Exercise helps keep blood sugar at a safe level by using up sugars and starches. Many diabetics, by following a doctor's advice, can continue their favorite sports.

Today, at age 40 life expectancy of the average diabetic is now more than twice what it was before insulin's discovery in 1921. To learn more helpful facts about this disease, send for your free copy of Metropolitan's Booklet, 318-N, "Diabetes."

Metropolitan Life Insurance Company

1 Madison Avenue, New York 10, N. Y.

TO VETERANS—IF YOU HAVE NATIONAL SERVICE LIFE INSURANCE—KEEP IT!

Sorex is a slave to his stomach

Not very many animals [illegible] as fast as life as the tiny [illegible]

Other wild things [illegible] hibernate in winter. But [illegible] keeps him constantly [illegible] from [illegible] to a frantic existence.

Every day, winter and summer, the shrew eats three-fourths or more of his body weight in food that he must catch.

To keep eating, Sorex has to keep hunting. And [illegible] food, he can't skip many [illegible]

In this respect, the shrew [illegible] man who has no insurance. Each [illegible] long as he can keep going.

If the man without insurance has [illegible] which have him up and [illegible] he [illegible] dip into savings to keep his family going. [illegible] has no savings, he has to borrow if he can [illegible] crippled by his [illegible] injuries.

[illegible] insurance — and [illegible] best easy. [illegible] what you've gained — time that your family will never miss a meal.

Another good thing about [illegible] is that it helps you [illegible] program — and helps you make sure that your [illegible] suffer [illegible] hardship [illegible]

When [illegible] living costs, it's more important than ever [illegible] that [illegible] are needed.

When you're [illegible] your Travelers [illegible]

MORAL: INSURE IN

The Travelers

ALL FORMS OF INSURANCE AND SURETY BONDS

The Travelers Insurance Company, The Travelers Indemnity Company, The Travelers Fire Insurance Company, The Charter Oak Fire Insurance Company · Hartford, Connecticut · Serving the insurance needs in the United States since 1853 and in Canada since 1865

A Gift

means much more . . . . . when it's made by

Sheaffer's

More than just a remembrance, you give a gift of unparalleled pride when you give Sheaffer's. The world's finest, Sheaffer's are the writing instruments everyone hopes to own "someday." Speed that happy occasion by selecting genuine Sheaffer equipment now for every name on your gift list. Nothing else you could choose means so much . . . nothing else gives such prolonged pleasure and satisfaction . . . receives such enthusiastic appreciation. Give Sheaffer's . . . and be sure to please.

W. A. Sheaffer Pen Company, Fort Madison, Iowa and Malton, Ontario, Canada

Every Sheaffer Writing Instrument, handsomely boxed individually or in sets, makes a magnificent gift

For sale at all good dealers throughout the United States and Canada

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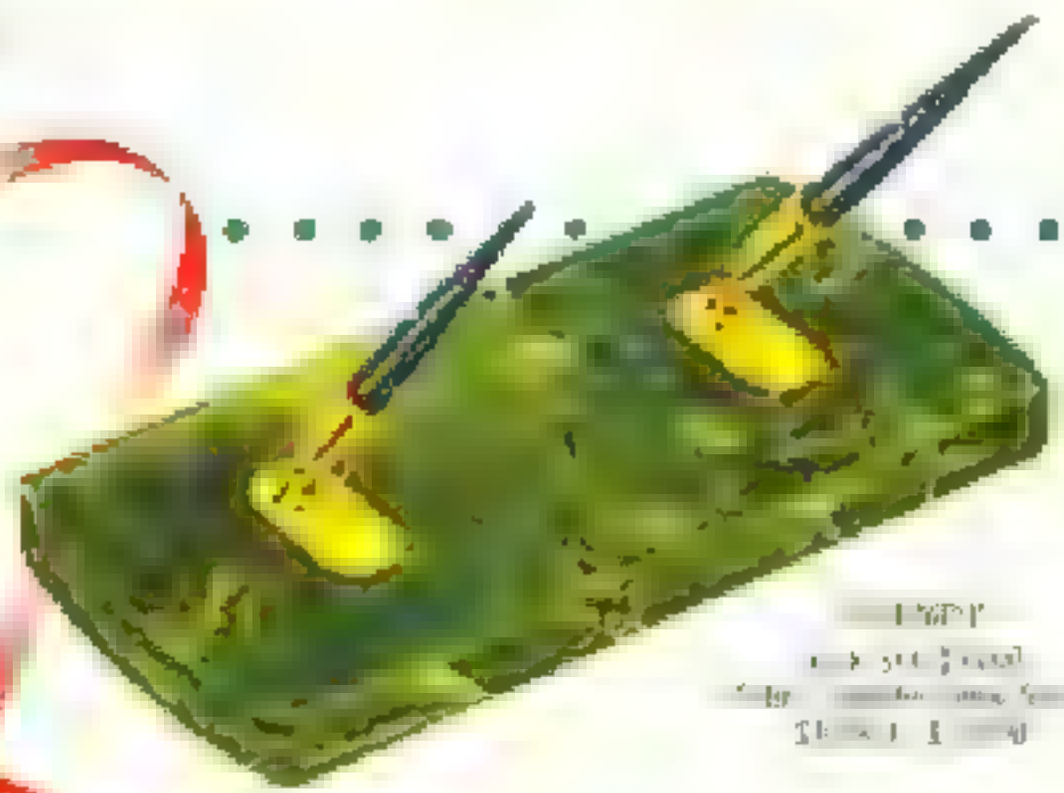
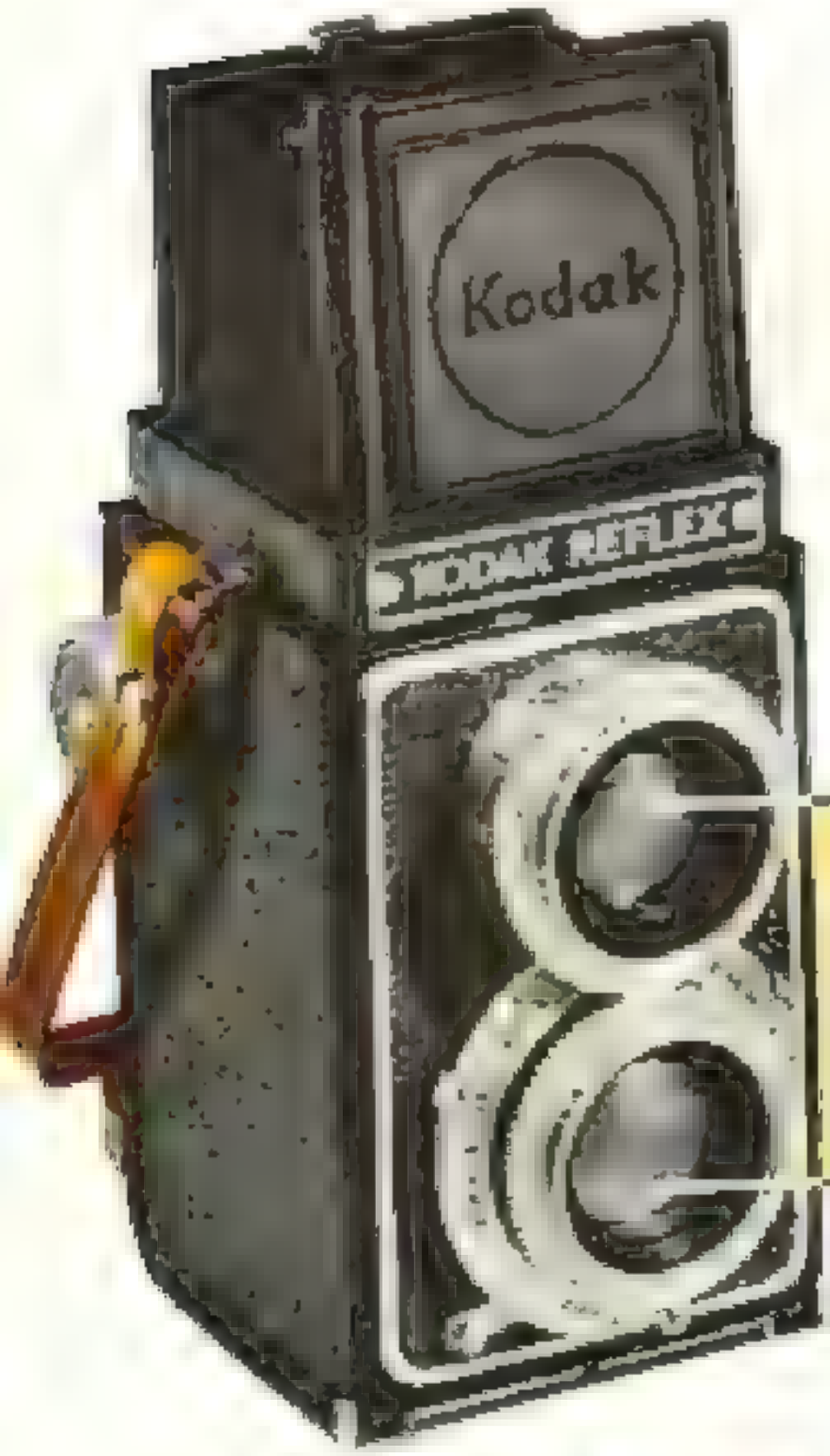




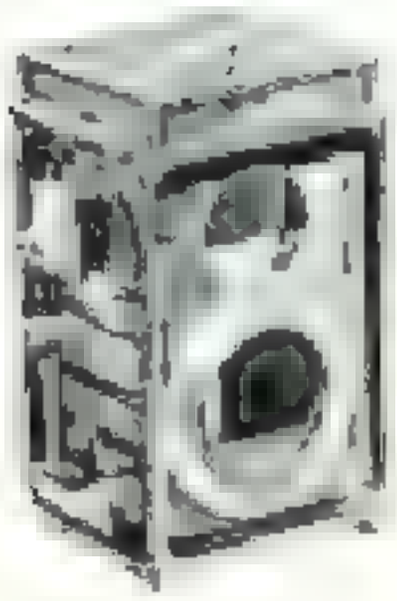
Really twins . . .

the lenses in your

Kodak Reflex Camera

Both

- **Fine, fast 4-element f/3.5**
- **Hard-coated for brilliance**
- **Superbly corrected for sharpness, for beautiful color**



Flash Shots -

Die-Cast Body

(Prices subject to change without notice)

Kodak

MISSISSIPPI *Vacation*

Mississippi Department
Mississippi Agricultural & Industrial Board
New Capitol Building, Jackson, Miss.

NAME _____

ADDRESS _____

CITY _____ STATE _____

LIONEL *The Lifetime Gift*

We know of no other gift that offers so many years of fun, excitement, and happiness as a LIONEL Train. Thousands are passed on from father to son! They are so real, so true-to-life. Watch them pull smoke. Hear them whistle, so realistically. Note the scale-detail perfection of their manufacture! For that boy you love—let it be a LIONEL this Christmas.

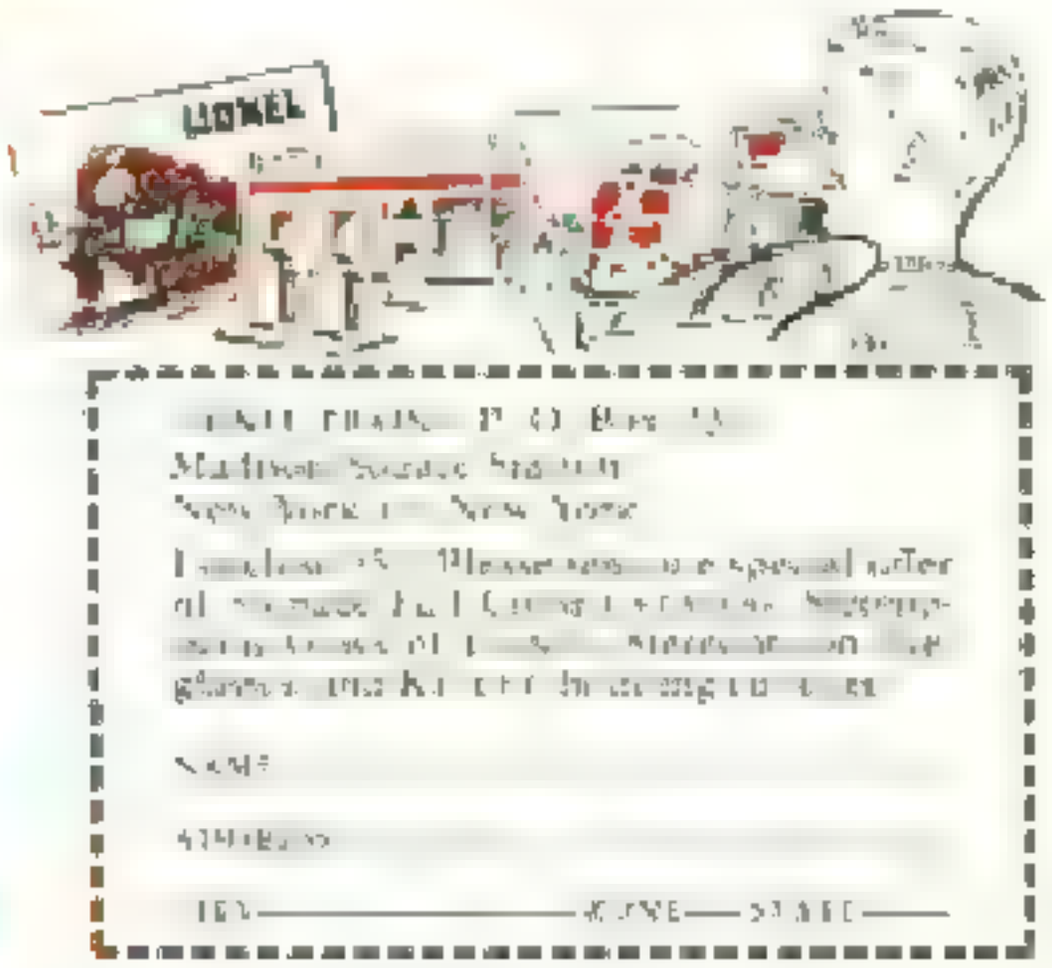
Do send for the catalog and read all about them—and ask your dealer to show them to you. LIONEL Train sets priced as low as $15.95.

Send for special offer

This entire package costs you only 25¢.

1. We send you beautiful 36-page Full Color catalog from Lionel.
2. Set of 35 [illegible] of LIONEL Trains in Action.
3. Pair of Stereoscopic Eyeglasses for viewing scenes.
4. Special KIT of 6 colorful [illegible] for your Train [illegible]

It's a wonderful package. Send for it today



LIONEL TRAINS, P. O. Box [illegible]
Madison Square Station
New York [illegible], New York

I enclose 25¢. Please send me special offer of [illegible] Full Color catalog, Stereoscopic Glasses, [illegible] Kit [illegible]

NAME

ADDRESS

CITY ——— ZONE ——— STATE ———

LIONEL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with the
VICTOR
LITE
WEIGHT
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MOTION PICTURE
PROJECTOR
VICTOR
PLEASURE AND EDUCATION FOR EACH MEMBER OF YOUR FAMILY
Victor Animatographs Corporation
A Division of Curtiss-Wright Corporation
Dept. B-15, Home Office and Factory: Davenport, Iowa
New York • Chicago • Distributors Throughout the World
MAKERS OF MOVIE EQUIPMENT SINCE 1910


NOW EVERY CAMERA OWNER
CAN MAKE
BETTER PICTURES
To make good pictures you must have proper exposure. Not until the advent of this amazing meter which uses the new Inc dent light method, was perfect exposure determination possible so swiftly and so surely.
YES, WITH THE
NORWOOD Director
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EVERY PICTURE YOU TAKE
CAN BE A PERFECT EXPOSURE
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soothing
relaxing
when applied with
Oster STIM-U-LAX JUNIOR
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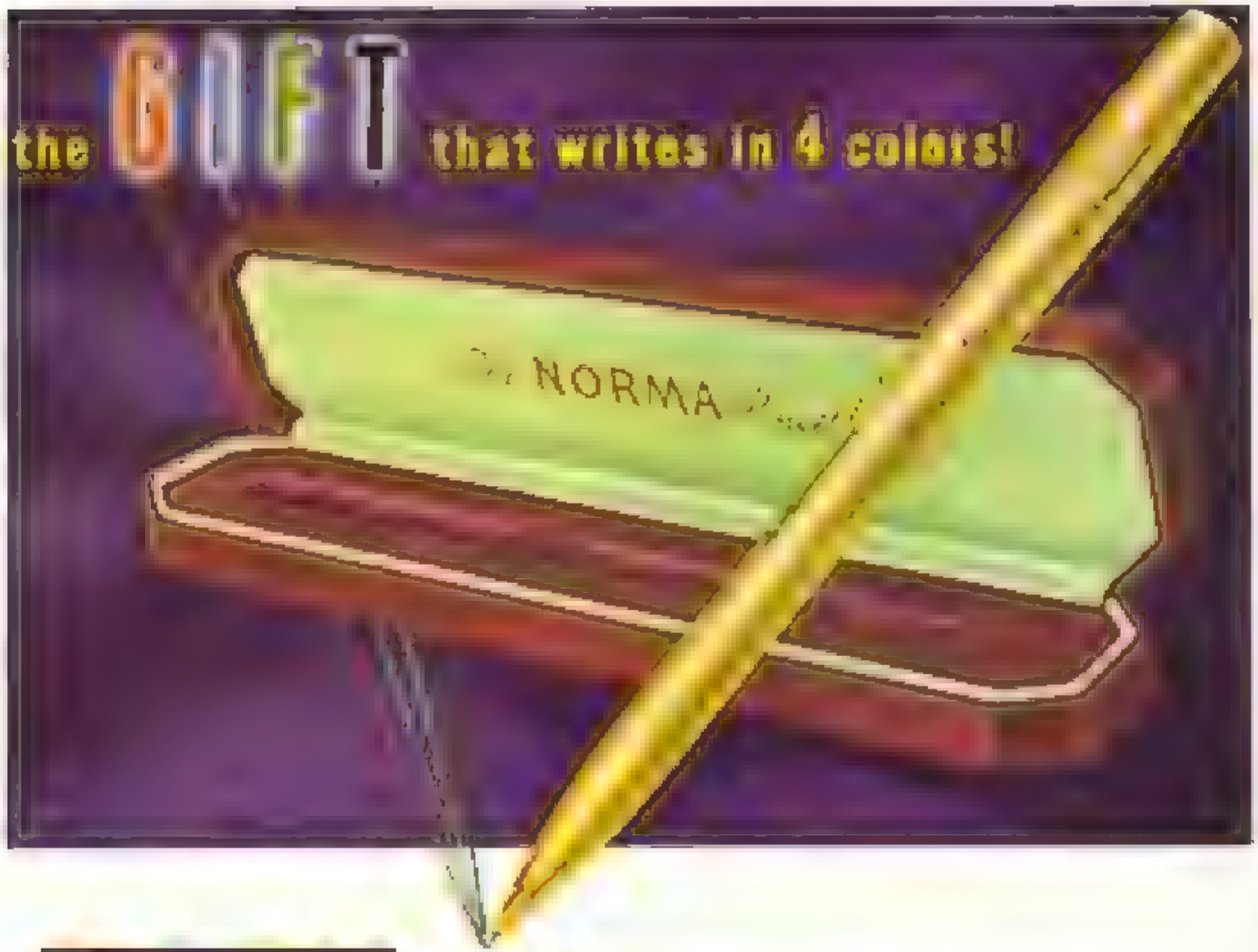
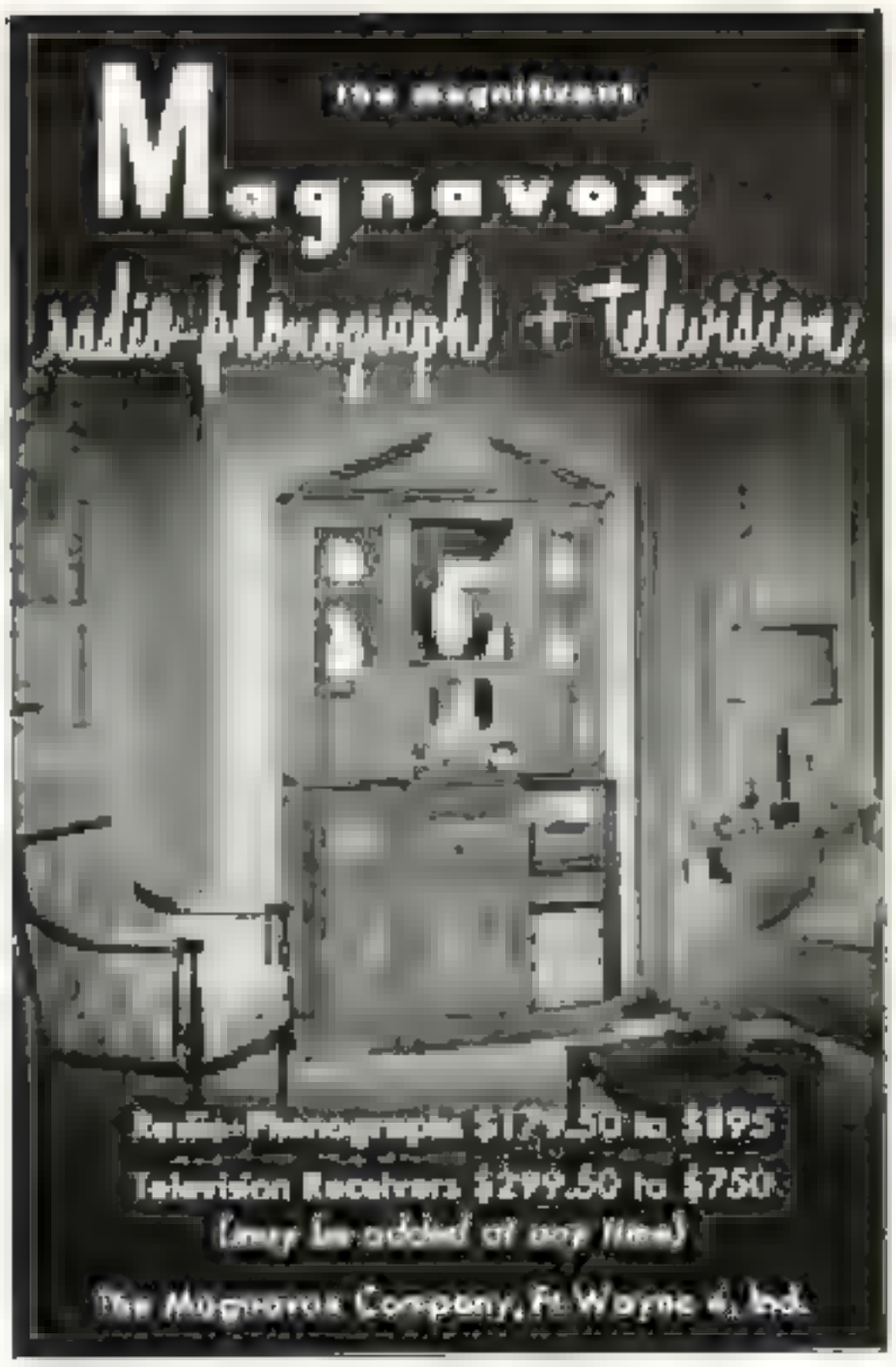


pencil writes red · green · blue - black



DEAF?

—Here's Good News!

[illegible]

[illegible]

[illegible]

[illegible]

BOYS! THIS BOOK IS A THRILLER

AND IT'S FREE

This exciting book is a Christmas gift direct to you from the famous Gilbert Hall of Science. 12 pages packed with over [illegible] facts about the Eleanor Mysterious Working Lamp which [illegible] by remote control. Also the dazzling [illegible] that have been and big [illegible] that reveal Nature's [illegible]. American Flyer trains that pull real [illegible] and produce real [illegible] and other scientific surprises. Mail coupon today.

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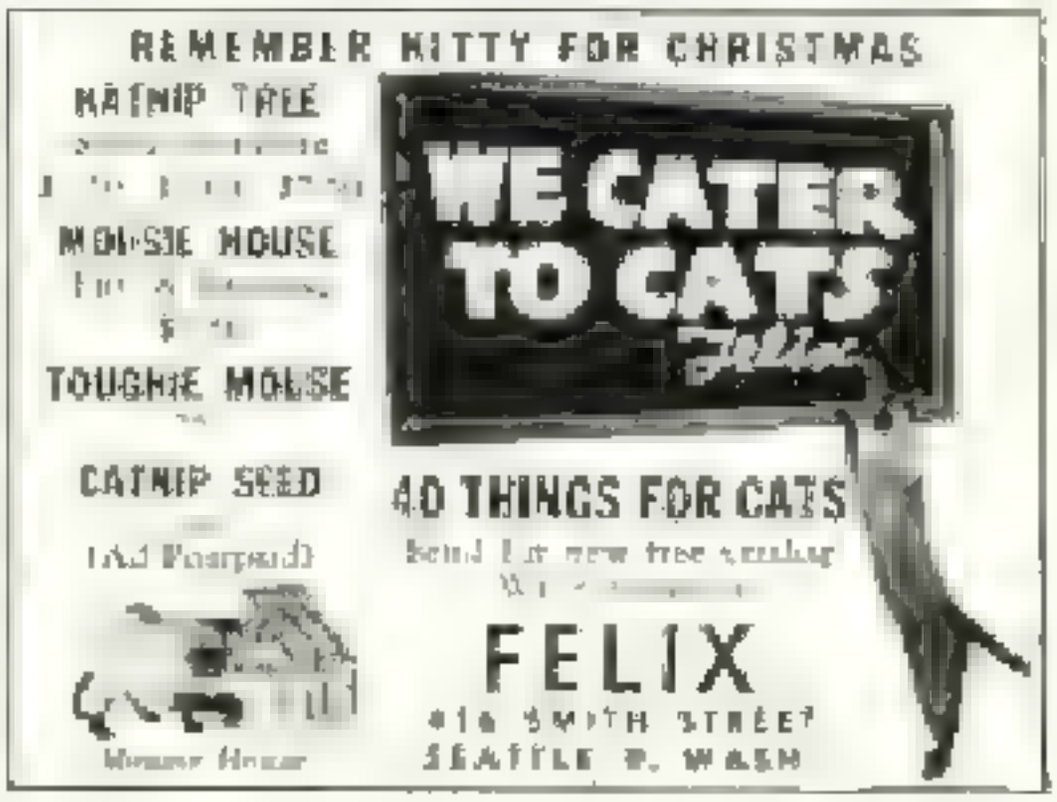


DON'T PULL HAIR FROM NOSE

Was Cause Fatal Infection

Use the Hygienic KLIPETTE Revolving Scissors

[illegible]

So Simple Everyone Has Found Surprise Have Adopted it gently, safely

Guaranteed to Satisfy or Money Back

[illegible]

• *General Electric Automatic Dishwasher saves hours of kitchen drudgery! Washes dishes sparkling clean. They dry in their own heat!*

1. A day's dishes done [illegible]

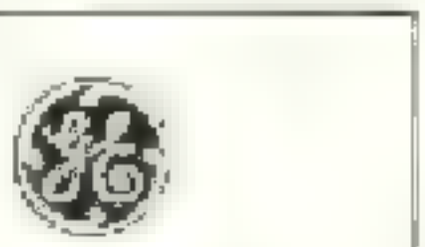
2. No more rough red hands! [illegible] better to stick to our soap.

3. Gives you new hours of freedom! [illegible]

4. So simple—so sanitary—so convenient! After [illegible]

NOTE: [illegible]

FREE: [illegible]



AUTOMATIC DISHWASHER

DOES THE DISHES BY ITSELF

GENERAL ELECTRIC

PLEASE FILL IN BLANK BELOW, DETACH, AND MAIL TO THE SECRETARY

Recommendation for Membership

FOR THE YEAR 1949 IN THE

NATIONAL GEOGRAPHIC SOCIETY

**The Membership Dues, Which Are for the Calendar Year, Include Subscription to the National Geographic Magazine*

To the Secretary, National Geographic Society,
Sixteenth and M Streets Northwest, Washington 6, D. C.: _____ *1949*

I nominate _____

Occupation _____
(This information is important for the records)

Address _____

_____ *for membership in The Society.*

Name of nominating member _____

Address _____

* DUES: Annual membership in United States, $4.00; Canada, $5.00; abroad, $5.00. Life membership, $100.00 U. S. funds. Remittances should be payable to National Geographic Society. Remittances from outside of continental United States and Canada should be made by New York draft or international money order. 11-48

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You're paying, according to national average, $2500.00 a year to operate each and every Typing Station in your office. To get the most out of this investment, you should be certain that obsolete, inefficient machines are not sabotaging your typing production and increasing office costs.

And that's where your nearby Remington Rand representative enters the picture.

Ask him to make a Typing Station Analysis. Let him bring a new Quiet Remington DeLuxe KMC right into your office. Notice how smooth . . . how fast . . . how responsive it is to your typist's touch. Remember — when she stops — that you heard hardly a whisper from its quiet operating mechanism. Glow inwardly at the distinctive appearance of its work (your correspondence and reports) . . . thanks to exclusive *Remington Rand Type* and *Page End-icator* that results in perfect page set-up. See, too, how handsomely the glare-free two-tone gray finish blends into your office setting.

Then — make the Quiet Remington DeLuxe KMC a permanent part of your office — watch typing production go up . . . office costs go down.

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THE FIRST NAME IN TYPEWRITERS

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"To Make Your Service Better Still"

In the past three years, we have extended and improved telephone service faster than ever before. We're trying to do even more.

Every month we're putting $120,000,000 into new telephone facilities—completing new buildings all over the country—adding 250,000 new telephones in cities and on farms—changing 100,000 telephones to dial—adding 170,000 miles of Long Distance circuits.

So if you're waiting for a new telephone or you'd like individual service instead of a party line or there's something about telephone service you'd like to have made better, we want you to know that we are moving along at a fast clip.

Your needs are very real to all of us and we won't be satisfied until everybody, everywhere, has more and better service than ever before.

BELL TELEPHONE SYSTEM

The thrill that comes only once

Quite soon—the time is coming when he will get his first important watch.

And though, throughout his life he may own other watches, the one he will remember for all time will be the very first, marking a very precious moment.

For a gift to cherish—none is more perfect than a watch. Your jeweler has a wide choice to show you, achievements of free craftsmen—of America and Switzerland—oldest democracies on two continents.

WHEN YOU BUY A WATCH, REMEMBER . . .

1. Many new styles now available, including shock-resistant and water-resistant watches, automatic self-winding watches, calendar watches, chronographs and other innovations from Switzerland.

2. All watches should be wound gently and regularly, and cleaned by your jeweler once a year. Even the most accurate watch (and the world's record for accuracy* is held by a 17-jewel Swiss movement) may vary a few seconds per week, depending on the wearer and the weather.

3. No matter what the make of your watch, it can be serviced economically and promptly, thanks to the efficiency of the modern jeweler.

*Official Kew-Teddington Observatory Tests, London, England.

For the gifts you'll give with pride—let your jeweler be your guide

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